

MINING

CONGRESS JOURNAL



JANUARY
1944



A
JOURNAL
for the
ENTIRE
MINING
INDUSTRY
Published
by the
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MINING
CONGRESS



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MINING

CONGRESS JOURNAL

VOLUME 30, NUMBER 1

Contents

FOR JANUARY 1944

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Front Cover

Sixty-ton dipper of Marion-built electric shovel, as big as any in the world, shown with its crew in dipper. It strips nearly one million tons of earth a month from coal fields. Operated by the Midland Electric Coal Co., near Middlegrove, Ill.

Editorials

For Shame	15
Get the Gold Mines Going!	15
Stockpiling—Freezing Metal Stocks	15
Suspension Bridge for a Belt Conveyor	16
By J. J. BELASCO	
Treasury Tunnel	18
Portable Ignitron Rectifiers for Mining Service	21
By J. T. BAILEY	
Western Mining War Conference	24
Mining Congress Activities in 1943	26
By JULIAN D. CONOVER	
Reducing Absenteeism and Turnover	30
By O. C. COOL	
Geology Through a Stereoscope	32
By JOHN E. MEYER	
Fires In Surface Mining and Milling Structures	40
By D. HARRINGTON and J. H. EAST, JR.	
The Decay Resistance of Oak Wood	44
By THEODORE C. SCHEFFER	
Coal Division Reports	
The Committees Report to the Annual Conference	48
Wheels of Government	52
Personals	55
News and Views	57
Manufacturers Forum	70

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THE AMERICAN MINING CONGRESS

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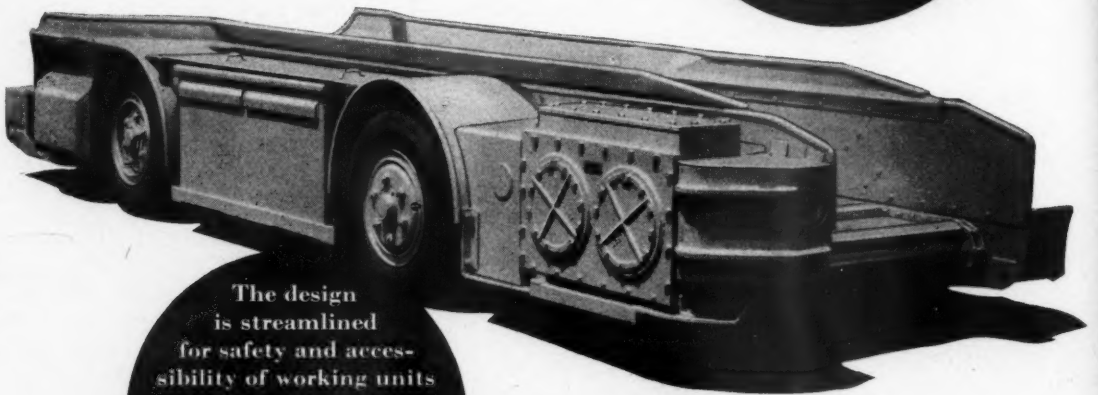


The New Joy 32-D



Safety and accessibility are the objectives of this new 32-D design. For instance, the driver's compartment is so arranged that nothing impedes his exit in case of emergency. The tilting steering wheel and the dual foot controls are a new and novel feature—permitting the driver to face forward at all times.

The steering is reversible—
with dual starting and braking controls—
increasing not only the factor of safety—
but also materially speeding up operation

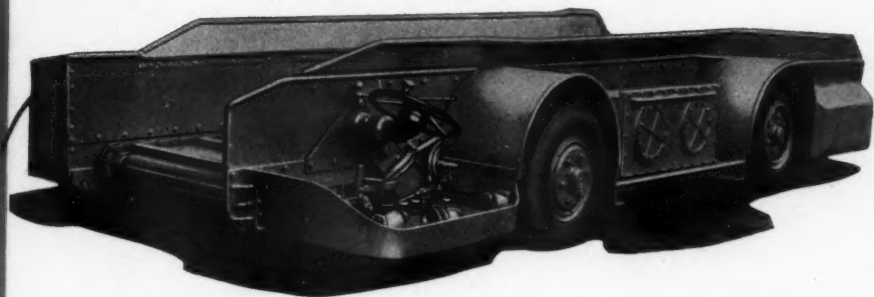


The design is streamlined for safety and accessibility of working units—the construction and fabrication is extra rugged and extra strong, assuring long, continuous service

Every working part is quickly accessible in this new design, which has been planned with a view to saving upkeep time and expense.

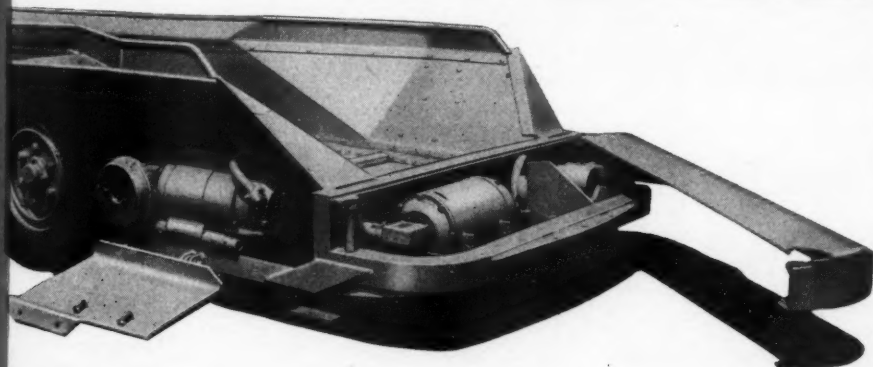
New Safety and Accessibility

Shuttle Car!



THE 32-D SHUTTLE CAR
IS AVAILABLE IN
CABLE REEL AS WELL AS
BATTERY TYPE

The same outstanding features that characterize the Battery type are built into the Cable Reel type—fast, safe . . . and all moving or vital parts accessible for quick inspection or repair.



REAR VIEW,
SHOWING SIMPLICITY
OF CONSTRUCTION

The 32-D Shuttle Car is not only fast and completely mobile, but it is also built to stand service, hard continuous service, with a minimum of up-keep. Its safety features, the ease with which driver can get in or out of driving seat platform, its reversible controls enabling operator always to face in desired direction—the accessibility of vital working parts—all of these points are important and mean more output per unit—and lower costs per ton.



HINGED BACK BUMPER,
AND VIEW OF
CONVEYOR

This hinged back bumper design is an important feature of this new car permitting complete accessibility to the conveyor mechanism, junction boxes and headlights. Another feature is the removable hinged motor cover, giving quick access to the rear hydraulic brakes, driving speed reducer and motor brushes.

*See a
Joy
Engineer*

JOY MANUFACTURING CO.
Franklin, Penna.



ALL COAL IS HAULED ON **TIMKEN BEARINGS** AT WYOMING MINING CORPORATION

This operator uses only one make of mine car—Enterprise—equipped with one make of bearing—Timken. That simplifies the entire mine car transportation system—makes it easier and more economical to operate and maintain.

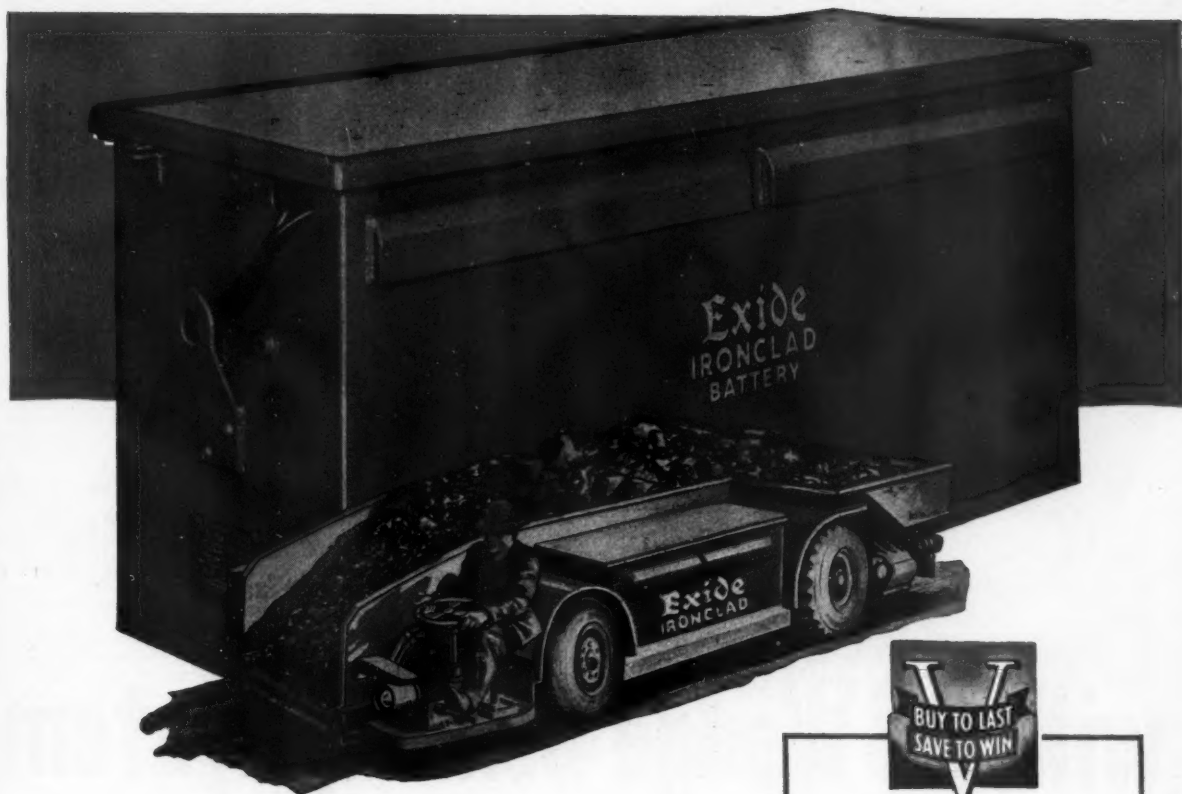
Extraordinary results with Timken Bearings are reported from the mine, located at Oceana—the virgin field of Wyoming County, W. Va.

Many other mine operators have found it pays to have all of their cars on Timken Tapered Roller Bearings for then they en-

joy Timken Bearing benefits in full, including maximum train operating speeds to and from the tippie; longer loaded trains hauled without increased power; simplified and economized lubrication; greater mine car availability—more cars in service, fewer in repair shop.

When mixed trains of Timken and plain bearing cars are operated, the plain bearing cars naturally hamper the Timken Bearing cars and nullify their advantages to some extent. The Timken Roller Bearing Company, Canton, Ohio.

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TAPERED ROLLER BEARINGS



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Hand-in-hand with this is the power of Exide-Ironclad Batteries. More Exides are used underground than all other batteries combined. The simple reason is that the power reserve of an Exide-Ironclad is abundant for every demand. Add to that, faithful, uninterrupted service, extreme ruggedness, and long life and you can readily see why Exide is the leader. A plus factor is the ease of maintenance which saves labor, and costs as well. When you buy an Exide you *Buy to Last*. Take care of them and *Save to Win*.

DELIVERIES—Despite wartime conditions, we are quite sure that we can make deliveries to meet your requirements.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



MAINTENANCE IS EASY IF YOU FOLLOW THESE RULES:

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- 2 Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
- 3 Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
- 4 Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery maintenance problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 1982.



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BATTERIES



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KEEP BUYING WAR BONDS

WRITE FOR BOOKLET 764-M

In 1944- for greater output check these GARDNER-DENVER products

Stepping up tonnage . . . speeding operations . . . cutting costs, is the job Gardner-Denver sinkers, drifters, stopers, mine car loaders and other mining machinery are doing today . . . and can do tomorrow! Check over these features and you'll see why:



✓ greater tonnage

Because of the famous Gardner-Denver fulcrum principle which provides more force for more crowd—greater speed at discharge, loading out more cars per man-hour is easy with the Gardner-Denver Mine Car Loader.



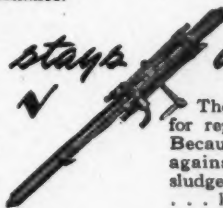
✓ higher drilling efficiency

Popular with mine operators and drill runners alike, the "CF 79" Continuous Feed Drifter assures higher drilling efficiency—together with minimum vibration and lower maintenance.

✓ more muck per shift stays underground



A capacity load every trip—plus the ability to develop maximum power and speed in either direction—are advantages of the compact, lightweight HBD Double Drum Slushing Hoists, which help mucking crews clean up more ore every shift.



There's no time wasted coming up for repairs with the R-104 Stoper. Because it's completely protected against the entrance of abrasive sludge, the R-104 stays underground . . . has plenty of extra power for faster drilling in even the hardest rock. Well-balanced—easy to hold.

✓ faster footage



Outstanding speed and reliability in a lightweight drill—the S-33 Sinkers.

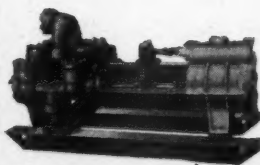


A drill for the bulldoze chamber or for toe holes in stopes—the S-45 Sinkers.

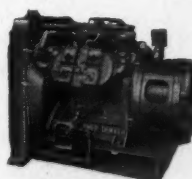


Famous for its speed, balanced performance and low maintenance—the S-55 Sinkers.

✓ grout service



Built to the exacting standards of grout pump service, Gardner-Denver High Pressure Pumps assure long, dependable operation. "Slush-proof" Patented Rubber Pistons, high carbon, alloy steel fluid piston rods, extra heavy valve cover plates and rugged frame mean high efficiency, regardless of operating conditions.



✓ saves space

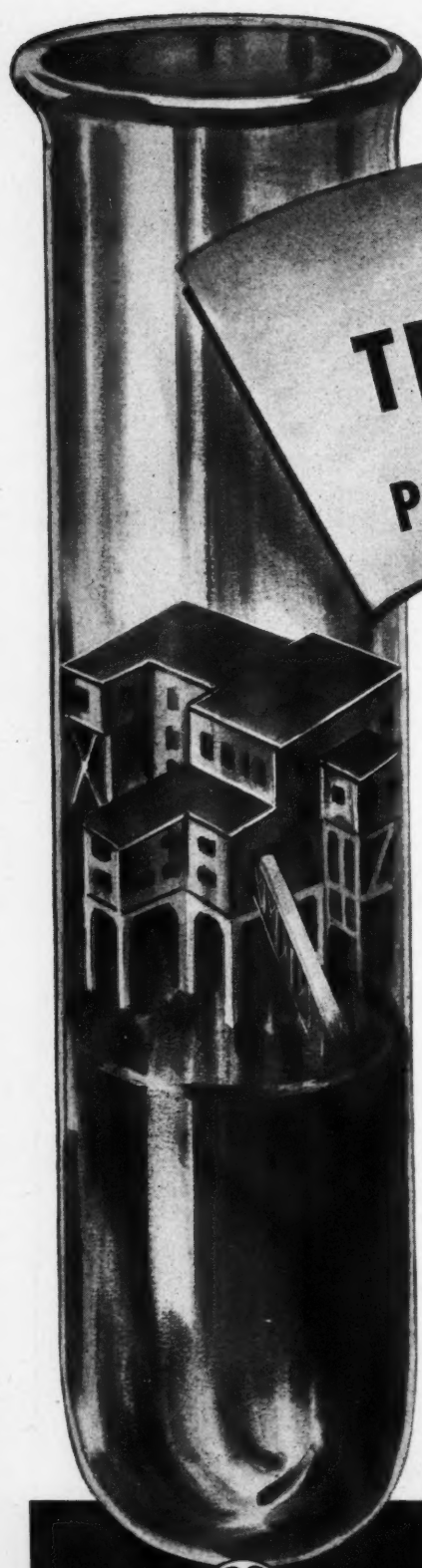
Providing greater air output at efficiencies comparable to much larger compressors, the "WB" Vertical, Water-Cooled Air Compressor is exceptionally compact . . . ruggedly constructed. Available with "V" belt drive or direct connected motor. May be readily moved from location to location.

For further information on Gardner-Denver mining equipment, write Gardner-Denver Company, Quincy, Illinois.

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Since 1859



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UNITED STATES

Miles from nowhere —but the message gets through

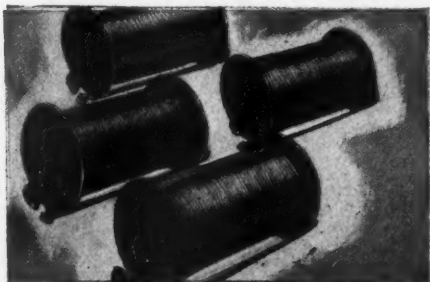
He'd crawled, run, crawled again. Now he was far ahead of his company...into enemy territory...surrounded...cut off completely from American forces except for a strand of lightweight wire...Laytex Assault Wire.

But his messages got through surely and clearly...made possible a successful advance.

Laytex Assault Wire is made expressly for jobs like this. It's ex-

tremely lightweight...yet tough enough to be used by advance scouts.

The use of such lightweight small diameter wire is possible only because the insulation is of such high quality—has high resistance to moisture, withstands a wide range of temperature changes and does not become embrittled when subjected to vibration and shock. Laytex Assault Wire has a talking distance of over five miles.



LIGHTWEIGHT Laytex Assault Wire weighs only thirty pounds per mile. This means that an advance scout can carry ample wire while pushing ahead.



SPECIALLY DEVELOPED for front line service, Laytex Assault Wire is hard at work in Europe, Asia, the South Pacific.



LAYTEX ASSAULT WIRE is unaffected by moisture or temperature changes because of the high quality of the insulation. This means it can be laid and used successfully regardless of climate or terrain.



FIVE MILES LONG—but messages get through clearly. Laytex Assault Wire, tested and re-tested for quality, has a proven talking distance of more than five miles.

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PULL-SHOVELS
WALKERS from
3½ to 35 cu. yds.





EDISON ALKALINE BATTERY *SURVIVES* FIRE & FLOOD

*News from the Far North for Users
of Mine Locomotives and Shuttle Cars . . .*

ADVANTAGES OF THE EDISON ALKALINE BATTERY FOR MINE LOCOMOTIVES AND SHUTTLE CARS

- ★ It is durable mechanically. High strength steel construction is used in the containers, grids, pole pieces, etc. The electrolyte is a preservative of steel.
- ★ It is foolproof electrically. It may be accidentally short-circuited, over-charged, over-discharged, or even charged in the reverse direction without injury.
- ★ It can be charged rapidly. It does not require critical adjustment of charge rates and, therefore, can be charged directly from the d-c mine power supply. It has no finish-rate limitations. It requires no equalizing.
- ★ It withstands temperature extremes. It is not damaged by freezing. Free air spaces on all sides of all cells provide ventilation for rapid cooling under high temperature conditions.
- ★ It is simple to maintain. Merely charge adequately, add pure water, keep clean and dry.
- ★ Its tray assembly and cell connections are extremely simple.
- ★ Its life is so long that its annual depreciation cost is lower than that of any other type of storage battery.

When a coal mine in Alaska caught fire recently, a 10-year-old Edison Alkaline Battery on a locomotive was trapped in the fire area. After the mine was flooded to put out the fire, the locomotive remained under water for nearly two months before it could be recovered.

When the battery was inspected, the tops of several cells were found to have been damaged by fire, but this was the only visible injury and required only minor repairs. Then the battery was given an electrical test. It delivered full rated capacity.

Although Edison Alkaline Batteries are not bought to withstand such abuse, the fact that they often do, in mines, railroads and industry, serves to demonstrate the great reserve of dependability which they have available under all conditions.

Some of the unique characteristics which account for the long life and dependability of the Edison Alkaline Battery are cited in the column at the left.

EDISON STORAGE BATTERY DIVISION, THOMAS A. EDISON, INCORPORATED, WEST ORANGE, NEW JERSEY

Edison
ALKALINE BATTERIES

MINING CONGRESS JOURNAL

Published for the Entire Mining Industry
by The American Mining Congress

Volume 30

JANUARY, 1944

Number 1

For Shame

THE NEWSPAPERS, public officials, the people and the managements of our nation's industrial enterprises have long been patient and tolerant in their attitude toward a great many labor leaders who, lacking in experience and judgment, unnecessarily precipitate conflict resulting in losses of production and of many millions of dollars in earnings of the workmen. Today, however, in a war which demands the maximum of effort to supply munitions to our men fighting on land and sea, no one can have patience or tolerance with the spectacle presented recently in the Christmas weekend strike of the steelworkers—a strike called by the CIO in an abortive effort to save face before the workers of the country after the coal miners had made the first break in the line on wage increases.

Prompt castigation of the strike by the nation's newspapers, including those frequently biased in behalf of labor unions, is known to have frightened steel union officials to such an extent that they turned to unfounded and ridiculous vilification of the officials of a major steel company. This amateurish effort to distract attention brought no cessation in the sharp and deserved criticism by the press, and it must be that these blundering union leaders now realize that they have done irreparable harm and disservice to the welfare of the honest working man, not only in the steel industry but to all those engaged in the American labor movement.

For shame!

Get the Gold Mines Going!

UNDER the Gold Mine Closing Order, L-208, many mines have now been idle since the fall of 1942 and still more properties have been standing since the spring of 1943. Ostensibly the gold mines were thrown idle because of the shortage of manpower and the desire to divert miners to properties producing critical and strategic metals and minerals.

Today, with the supply of these metals equal to and in some cases even affording a modest surplus above our war needs, consideration should be directed to the stand-by expenditures for pumping, timbering, clearing rock falls and other necessary maintenance work which are a serious burden to the owners of the gold mines. Many of our gold mines are very deep and if allowed to fill with water may never be reopened. In one interconnected group of

mines there are over 500 miles of underground workings, in which, as is the case in many other properties, the reserves of ore are not large. Considering the cost of pumping and cleaning rock at such properties the amount of ore actually in sight would not be sufficient to justify the very great expense of reopening and restoring them to operation. It thus becomes essential that the operators of gold mines be permitted to resume production sufficient at least to carry maintenance costs as soon as this can be permitted by the Federal war agencies.

The part which the gold mines play in furnishing employment and creating wealth was thoroughly demonstrated after the last war. In business depressions gold and silver mines have been the "white spot" on the business map and their communities have shown the highest levels of employment, payrolls and business activity.

The mines now idle can again perform this useful service but they cannot be brought into readiness overnight to give employment to their full complement of thousands of workmen. This will take a number of months and the communities and States affected and the Governmental agencies should give close attention to this situation—and get the gold mines going.

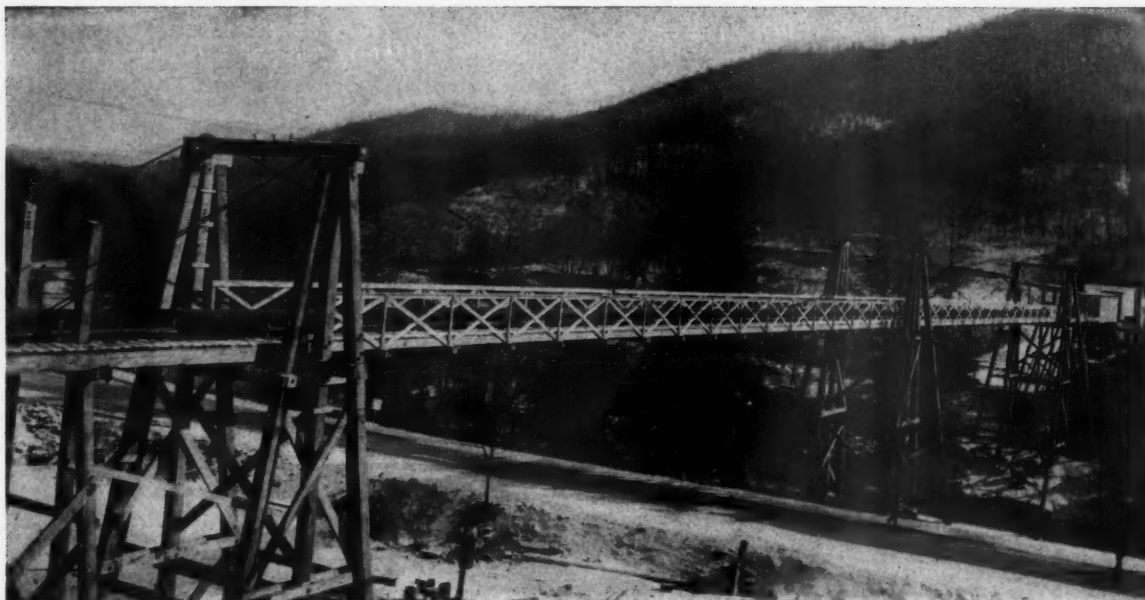
Stockpiling—Freezing Metal Stocks

WHEN the present war began this country learned to its sorrow that our stocks of many essential metals and minerals were insufficient to the mounting need. We had experienced a similar shortage in the last war but repeated efforts in the seven years preceding World War II to provide reserve stores had brought little of constructive results.

Senator Scrugham of Nevada and his associates, determined that the nation shall not again be placed in this perilous position, have introduced a stockpiling bill which would freeze strategic and critical metal stocks at the end of the present war and build up a reserve sufficient to meet the needs of a major national emergency of three years' duration. Thus not only will provision be made for national safety but the demoralization of the metal markets, caused by the dumping of surplus stocks much larger than in the last war, will be prevented. Purchases for stockpile purposes will ease the transition from a war to a peace time economy for many mines.

Realization of the end-of-the-war surpluses brings great concern, and it is highly important that the legislation provide for the segregation to stockpile, not only of surplus stocks of finished metals but also of non-ferrous materials in process (at all stages) and of scrap and secondary materials resulting from hostilities in the present war.

The effect of unregulated disposal of metal and mineral stocks at the war's end on employment in mining communities can be realized from the many months of unemployment and acute distress experienced after the last war. For the safety of the nation and for the protection of our mining populations, a stockpiling bill should be enacted immediately.



Suspension Bridge for a Belt Conveyor

A novel solution to an outside coal transportation problem worked out by Pardee & Curtin Lumber Company through the necessity for conserving critical construction material and utilizing scrap metal.

A STRUCTURE of unusual design—a rope suspension bridge—to support an outside belt conveyor—was recently completed by the Pardee & Curtin Lumber Company at Bolair mine near Webster Springs, W. Va. The coal is opened on the opposite side of the river from the railroad and a belt conveyor—30 in. wide, 700 ft. long and operating at a speed of 200 ft. per minute—was installed to transport coal from a bin near the drift mouth, crossing over a highway and the Gauley River, to the tippie on the railroad. As shown in the attached sketch, this 700 ft. structure has trestle approaches at each end and two center suspension spans, each 136 ft. long. Wood construction is used throughout; the floor of the trestle and bridge is 8 ft. wide; the conveyor is placed in the center which leaves a walkway along each side for belt inspection and for oiling the rollers. The trestle ends will be enclosed with roof

and siding; the suspension spans, however, will be open but the conveyor will have a top and partial side covering for weather protection.

New Problems in Design

The reason for first considering this type of construction was to eliminate the use of critical structural steel and the design, made by our own staff, was thoroughly discussed before the plan was adopted. We were not concerned with the general load factor as our company has built a number of "swinging bridges," varying from light passenger walkways to heavy truck roadways, but the idea of a cable suspension for a belt conveyor was new in our experience. The doubtful point of course, was whether or not this class of bridge would be sufficiently rigid for a conveyor support, and apparently the idea was also new to everyone else because contacts



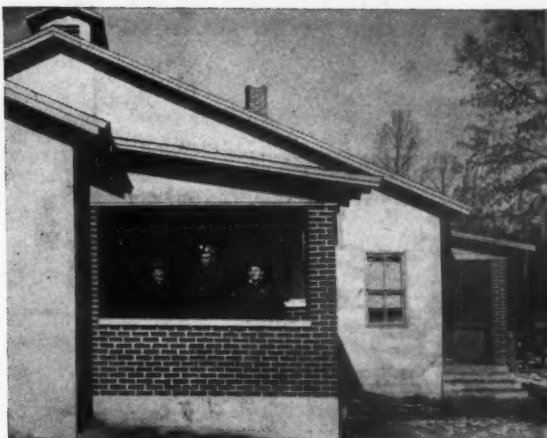
By J. J. BELASCO

Chief Engineer
Pardee & Curtin Lumber Company

with belt manufacturing companies did not reveal any precedent.

However, except when changing from full to empty, the belt load is steady, and it was our belief that having sufficient strength in the cables, any up and down movement in the suspension span would be so slight as not to cause any serious belt trouble—particularly since the conveyor operates in a self-contained rigid frame. The side sway seemed more serious as there was no practical way of anchoring; but, by pulling the cables together, about 1 ft. off line at the center of the span, the horizontal

Technical drawing of a suspension bridge and trestle from surge bin to tippie. The drawing includes a side elevation and a plan view. The side elevation shows a long bridge structure with a central trestle section and suspension spans. Key dimensions include 156'-0" for the main span, 156'-0" for the trestle section, and 156'-0" for the approach spans. The plan view shows the bridge's width and the location of the surge bin and tippie. Labels include 'SURGE BIN', 'TRESTLE', 'SUSPENSION BRIDGE', and 'GAULEY RIVER'.



J. J. Belasco; Ralph Beckwith, assistant mine superintendent and Marvin Hoover, superintendent of construction

Reclaiming Scrap Steel

The whole installation utilizes to the fullest extent, materials salvaged from scrap. The suspension cables are worn monitor incline rope that was discarded at one of our plants a unit for further hoisting service but still had sufficient strength to support a static load. Each cable consists of two 1½-in. ropes clipped together so as to act in parallel and especially unique are the rope saddles on top of the suspension towers: which were made from segments of old locomotive wheels. The hanger rods, as well as the bolts used in the trestle and tippie were, for the most part, salvaged from scrap iron and threaded in our machine shop. Continuing the salvage idea, the only new parts in the conveyor are the belt with the frame and rollers, purchased from the Jeffrey Manufacturing Company; the head and tail sections, together with the drive and gravity take-ups, were recovered from an abandoned tippie.

Mine and Surface Plant

The main haulage from the mine is with a 30 in. Jeffrey belt conveyor which discharges into a 40-ton surge bin located about 200 ft. outside the drift mouth. Coal is fed from the bottom of this bin onto the outside conveyor by a reciprocating plate feeder. The mine belt carries coal and slate; a fly-gate at the top of the bin diverts the slate from the conveyor discharge into a loading chute for trucks which transport it to the refuse dump. The tippie located across the river is equipped with shaker screens to load three grades of coal into railroad cars.

The seam mined is the Fire Creek

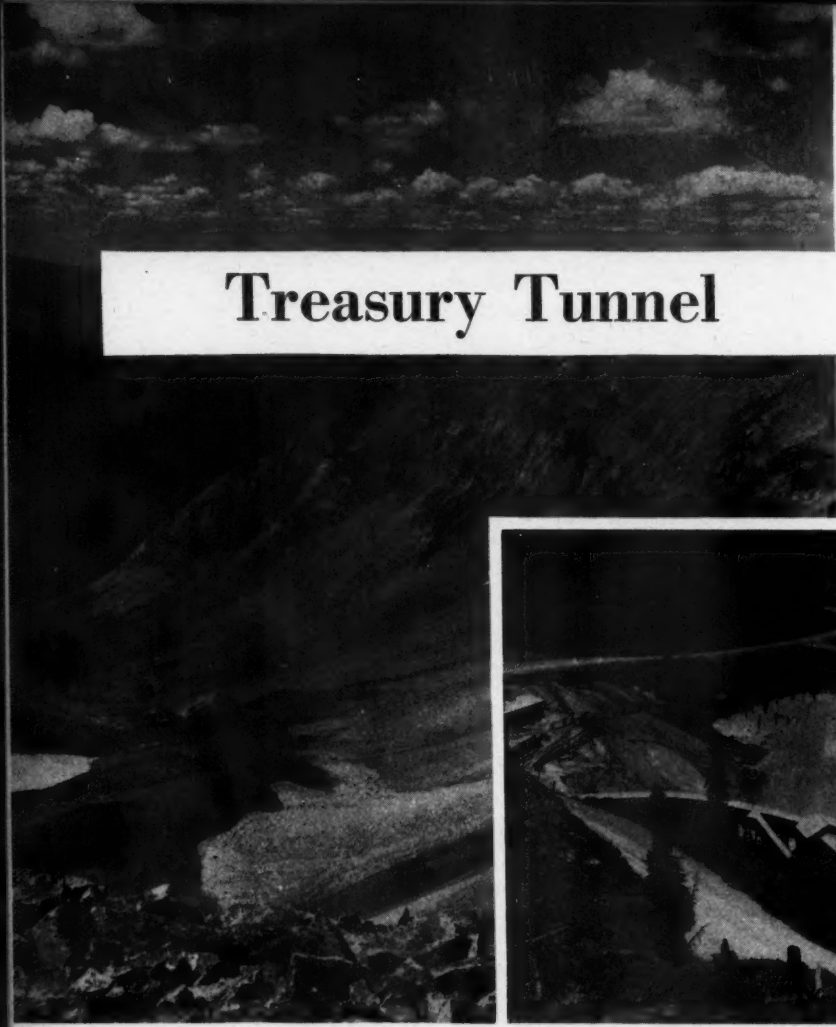
which is the lowest in the coal bearing measures in this vicinity and has an unusual thickness of 7 ft. At the outcrop, there is a heavy dip from 10 to 12 percent but this slope varies from pitmouth to face of the main entries, which are now in about 1,300 ft. The main entries were driven with Joy loaders and shuttle cars and it is interesting to note that in working against the steep grade which was first encountered, a rope hoist was needed to move the shuttle car from the entry face to where it discharged onto the main belt. The plan of mining is the conventional room and pillar with mechanical loading and shuttle cars; room entries driven at right angles to the main heading are approximately level and no difficulty is expected or nothing unusual is anticipated in the general underground operation.

There was, however, a very unusual condition encountered in making the mine portal; the outcrop was so deeply covered with earth that a diamond drill was necessary to discover the seam location. The amount of yardage necessary to remove to open the coal required a bulldozer and surface around the drift mouth has somewhat the appearance of a small strip operation.

Conclusion


The outside conveyor has just been put in operation and so far no belt or other trouble has been encountered. Final judgment must of course be deferred until experience proves whether or not this type of construction can be approved as satisfactory.

Mention has already been made of the use of salvage but a special word should be said in praise of the construction foremen and crews for the many valuable suggestions which they made toward utilizing old material and their interest in working out ways to make the best of what could be obtained.



Treasury Tunnel

Famous production properties high in the San Juan Mountains of Southwestern Colorado are being reopened to meet demand for strategic metals.



Upper left—The famous Black Bear Mine, 1,000 ft. below the rim of the Imogene Basin on the Telluride side of the La Plata Mountains. Note the old tram line. Upper right—Surface buildings at Treasury Tunnel

COLORADO'S famous Black Bear mine, in the Telluride-Silverton-Ouray district, is being reopened. The transportation problem which forced the closing of the mine is being solved by means of a long tunnel now being driven to replace the 2½-mile aerial tramway which was the property's former outlet for its ores. The operation of such a tramway in this high

and rugged country was extremely costly and hazardous, and the Black Bear was closed in 1924 following a snowslide which destroyed surface buildings and killed two men.

Metals Reserve has leased the Black Bear, Barstow, Iron Hand, Handicap and Treasury Tunnel, along with other near-by claims, on a royalty basis, from the Idarado Mining Company.

The Sunshine Mining Company, of Yakima, Wash., will operate the leased properties as agents of Metals Reserve, and the contract for the tunnel work was awarded to Stiers Brothers, St. Louis, Mo.

To reopen the old properties, a 6,300-ft. extension is being driven from the end of the original 5,539-ft. Treasury Tunnel, which opens beside

Below—General view of surface building, tunnel portal and dump





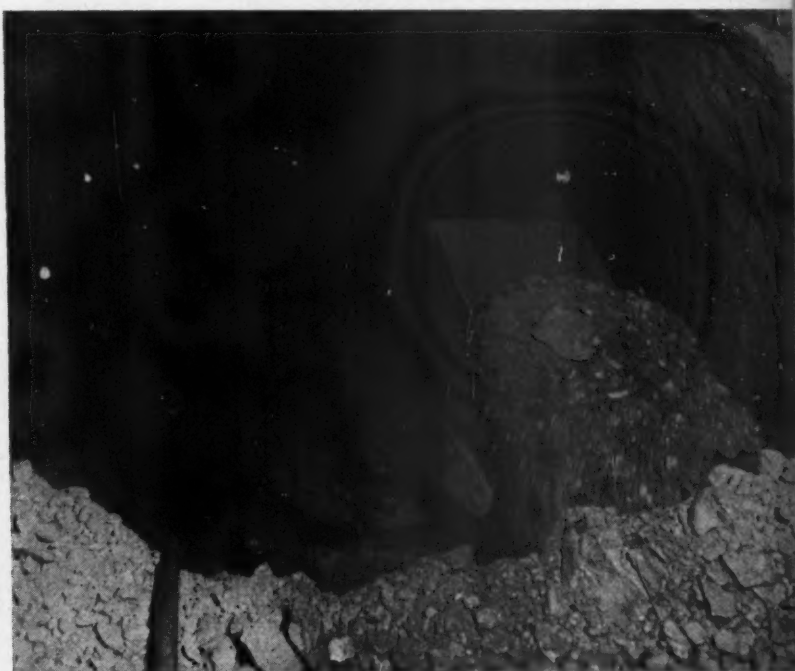
Crew rides to and from heading in muck cars. No man car has been constructed because of shortage of materials and manpower



Drilling in the heading of the tunnel from the jumbo. Five drills are used, two in the lifter positions and three above. Note special steel rack on rear of jumbo



Loading the lifter and cut holes



Mucking out the round after shooting, with a Model 21B Eimco loader. Slide rails are used to extend the track

the highway between Ouray and Silverton on the east side of the La Plata Mountains, at an elevation of 10,620 ft. The old tunnel was driven on a 1 percent grade and the extension is being driven on a 0.5 percent grade. From the end of the extension, a 1,100-ft. raise will connect the Treasury Tunnel with the No. 6 level of the Black Bear workings, which is at an altitude of 11,000 ft.

Driving of the extension began on July 13, 1943, and has been moving along at an average rate of 33½ ft. per day. The same 7' x 9' section is being driven and, judging from conditions in the old tunnel, very little timbering will be required. At pres-

View in the blacksmith shop near the tunnel portal, showing the hot milling equipment and the two men who sharpen all the bits used on the job





The men who are responsible for the job—left to right—Attorney for the Sunshine Mining Co.; Oscar H. Johnson, Pres. of the Idaho Mining Co. and the Mine & Smelter Supply Co. of Denver; J. D. Nicholson, Gen. Mgr., Mine & Smelter Supply Co.; John Edgar, Engineer in Charge for Sunshine Mining Co.; and John R. Austin, Gen. Supt., Stiers Brothers Construction Co.



The cherry picker which is used to shift cars during the mucking operation. The empty car is lifted by the air hoist and then pushed by hand over into the slabbed-off place to allow the muck train to pass. Then the empty is placed back on the track and pushed to the heading

ent, it is undecided whether the raise to connect with the mine workings will be vertical or inclined, also whether it will be two or three compartments.

Progress on the tunnel has been satisfactory despite rather heavy flows of icy water and manpower shortages which forced curtailment of drilling operations to a 2-shift basis until November 1, when 3 shifts were resumed. The old tunnel was making 1,100-1,200 g.p.m. and an additional 1,500 g.p.m. has been encountered in the new bore. The water encountered has a temperature of 37° F.

The drill jumbo, 30 ft. long and weighing 7 tons, carries five Ingersoll-Rand DA 35 drills. Ten Ingersoll-Rand airline lubricators are used, connected in parallel pairs. From 32 to 36 7-ft. holes are drilled per round, requiring 1½ hours. The round is Pyramid. Jackbits are used and are changed at the heading of the bore by two nippers. Starter steel is 3 ft. long with 2-ft. changes. Starter bits are 1½ in. and the finish bits are 1½ in. No pilot hole is drilled. The full heading crew consists of 13 men, and 5 men in the blacksmith shop sharpen all bits and service all steel.

Shot holes are loaded and tamped by hand and the round is electrically fired in delays of 1 to 10, from the shooting switch 1,500 ft. back from the face. Illinois Gold Medal 40 percent and 60 percent dynamite is being used with a powder factor of 121 lbs. per cubic yard. Ventilation is provided through an 18-in. fan line by a reversible 7,000 c.f.m. Roots-Connersville blower unit, driven by a General Electric motor. Normal ventilation is

positive but after blasting the fan is reversed for a time to clear the heading. The fan is controlled by the compressor operator outside, who receives his orders from the heading crew by telephone.

Each round produces about 28 cu. yds. of muck, which is loaded by a Model 21B Eimco loader into Granby-type cars of 90 cu. ft. capacity, requiring 8 or 9 cars. An additional 21B loader is kept on hand as a spare. Track gage is 24 in., and 2 Atlas, 1 Goodman and 1 International Diesel locomotives are on the job for haulage. Three overhead trolley type cherry pickers, with pneumatic lifts, are used—one for switching cars at the heading, one for parking the mucking machine, and one for changing batteries at the portal.

In the Black Bear there are 275,000 tons of blocked ore and 150,000 tons of probable ore. Known reserves in-

clude 44,000,000 lbs. of zinc, 24,400,000 lbs. of lead, and 9,200,000 lbs. of copper. Ores of the district are complex sulphides, which have produced large quantities of gold and silver in past days. For the duration the properties will be worked for strategic metals.

The present mill at the Treasury portal has a 250-ton capacity. Ore will be transferred from the Black Bear workings down a raise to the tunnel, trammed to the mill at the portal, and the concentrates trucked to rail head at Ouray.

It was originally estimated that the tunnel would be completed in 6 months and the raise in 5 months, a total of 11 months. John R. Austin, well-known tunnel expert, is superintendent for Stiers Brothers Construction Co., contractors who are driving the tunnel and raise. John Edgar is engineer in charge for Sunshine Mining Co.

Loaded car headed for the dump



Portable Ignitron Rectifiers For Mining Service*

A MERCURY-ARC rectifier may be defined as a static equipment for converting any conventional a.c. voltage at a given frequency to any desired d.c. utilization voltage.

Mercury-arc power rectifiers have been used in Europe for more than 20 years for railway and steel mill applications. As early as 1924, an installation of a 500-kw. rectifier was made in an anthracite mine in the state of Pennsylvania for haulage service. The use of rectifiers has been stimulated in this country during recent years due to a more general realization and recognition of the inherent advantages of this type of equipment, the fact that they require the use of considerably less critical material, and because motor-generator set production has been largely tied up for direct Army and Navy uses. There are now over 35,000,000 kw. of rectifier equipment of all types installed in the United States. In fact, 10 percent of all energy that is generated in this country this year will pass through rectifiers in aluminum plants, railway power stations, magnesium plants, chemical plants, industrial plants, and mines.

General Types

There are two main general classifications of power rectifier equipment:

1. Sealed-ignitron mercury-arc rectifiers which make use of permanently evacuated sealed ignitron tubes.
2. Pumped-ignitron mercury-arc rectifiers which make use of continuously evacuated tanks whose vacuum is maintained during operation by means of vacuum pumps.

The sealed-ignitron rectifiers are

* Presented December 7, 1943, at Morgantown, W. Va., before Monongahela Valley Coal Mining Institute.

Track mounted conversion equipment has great advantages in concentrated mechanical mining by furnishing adequate D.C. power to the face machines. Mr. Bailey outlines fundamental principles and operating characteristics of the ignitron units.

By J. T. BAILEY

Industrial Engineering Division
General Electric Company

generally built in sizes up to and including 500 kw. at 275 volts d.c. and 750 kw. at 575 volts d.c. The minimum capacity usually considered in mining service is 100 kw. They may be constructed in accordance with a design for general industrial use, having a rating of 100 percent load continuously, 125 percent load for two hours, and 200 percent load for one minute; or, they may be obtained with the so-called mining rating of 100 percent load continuously, 150 percent load for two hours, and 200 percent load for one minute.

The pumped-ignitron mercury-arc rectifier equipment is furnished in the standard ratings above those specified as the upper limit for sealed-ignitron equipment. These rectifiers are generally applied to large electrochemical installations, and railway and steel mill applications.

This discussion describes mainly the portable mining type equipments since they lend themselves so admirably to the requirements of a mechanized mine.

The majority of coal mines make use of electric locomotives for mainline and gathering haulage. These locomotives are powered by high-torque direct-current traction motors. Since direct-current power is required

for locomotives, the cutting, drilling, and loading machinery are also usually driven by direct-current motors. This results in the need for blocks of power at a number of load centers throughout the mine. If portable equipment is used, less copper is required and the voltage drop is kept to the minimum, thus higher output is maintained since conversion stations can be kept closer to the load center as the working face advances.

Portable Equipment

Fig. 1 shows a complete portable rectifier equipment consisting of the three standard cars. Reading from left to right these are the a.c. switchgear car, rectifier transformer car, and the rectifier car containing the d.c. switchgear, water-to-air heat exchanger, and the rectifier proper.

Fig. 2 shows the a.c. switchgear car in which are mounted the incoming line Magne-blast air circuit breaker, control power transformers with high interrupting-capacity fuses, automatic a.c. reclosing relays, and complete complement of meters, over-current relays, and accessories.

Fig. 3 shows the rectifier transformer car consisting of the Pyranol insulated, self-cooled rectifier transformer with all the usual accessories

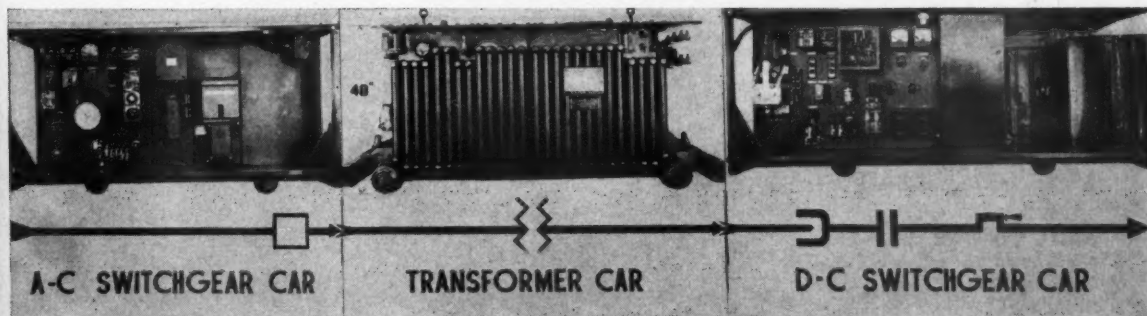


Fig. 1. Three-car train makes complete unit

and protective devices. The Pyranol transformer is recommended because Pyranol is a non-inflammable and non-explosive liquid and, therefore, is safe to use in the mines. The Pyranol transformer is sealed and its windings are protected against the accumulation of dust and dirt; it has the same high insulation level that has proved so essential in the oil-immersed type.

Fig. 4 and 5 show front and back views of the rectifier car which consists of three component equipments; rectifier firing circuit and sealed ignitrons, water-to-air heat exchanger equipment, and d.c. switchgear equipment. The rectifier proper consists of the required number of sealed ignitrons whose operation is controlled by a static, magnetic type of firing circuit. The principle of this type of firing circuit has been described in many previous articles.

The water-to-air heat exchanger equipment is similar to the radiator system in the modern automobile. It consists of a surface air-cooler and surge tank with pump. Water is pumped through the sealed-ignitron jackets and back to the surface air-cooler where the excess temperature is reduced by means of a fan. The water is then returned to the surge tank for re-use. In this closed cooling system, only small quantities of make-up water need be added from time to time. Distilled water is recommended for this cooling system to prevent corrosion of its various parts.

The d.c. switchgear includes a d.c. line contactor with an automatic reclosing device, a d.c. line disconnect switch, d.c. voltmeter and ammeter, the necessary auxiliary relays and protective devices, and a d.c. voltage regulator which is a standard part of the equipment.

Portable Equipment Meets Mining Requirements

The question is often asked as to just what are the essential requirements of underground conversion equipments and how does the portable rectifier fulfill these requirements? The following tabulation answers this and indicates how satisfactorily these prerequisites are met by the sealed-ignitron mercury-arc type of rectifier equipment.

Continuity of Service

1. High overload capacity.
2. No appreciable time lag in starting.
3. No major rotating parts to wear out.
4. A spare igniter furnished in each sealed ignitron.

Safety

1. No hazard to personnel due to rotating apparatus.
2. Grounded positive construction recommended, thus making car frame,

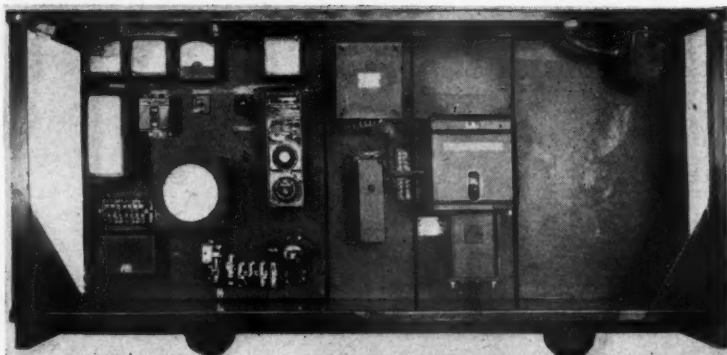


Fig. 2. Portable switchgear car

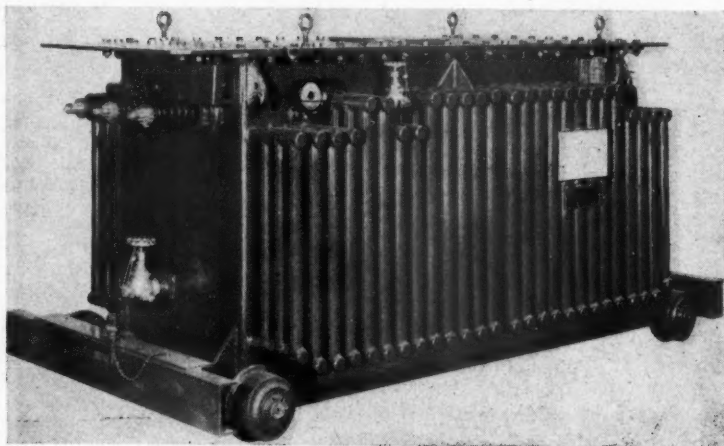


Fig. 3. Portable transformer car

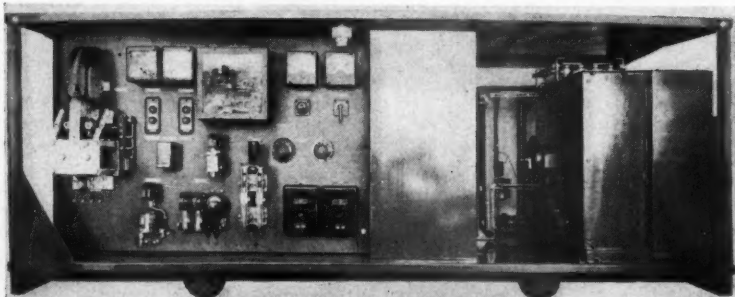


Fig. 4. Front view of rectifier car

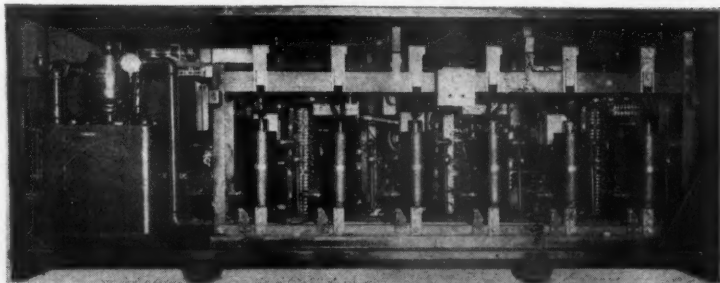


Fig. 5. Inside view of rectifier car

sealed ignitron jackets, and firing circuit at ground potential (grounded negative construction can be furnished where required).

3. Enclosed devices.

Full D.C. Voltage at the Face

1. Three completely portable cars mounted on mine-car-type wheels make it easy to relocate these equipments as the face advances.

Low Operating Cost

1. For a comparison of losses of rectifiers as compared with other types of conversion equipment, refer to Fig. 6.

Ease of Installation

1. No heavy concrete foundation required for rectifier equipment.
2. All interconnections are furnished by the manufacturer.

Full Automatic Operation

1. Automatic reclosing equipment is furnished on both the a.c. and d.c. sections of the rectifier equipment.
2. An ignition checking relay is included to check faulty operation of the sealed ignitrons.
3. Overload and reverse current protection is included.

Low Height

1. The standard height of the portable equipment is 48 in., although it is possible to design for even lower heights in special cases.

Use of a Minimum Amount of Critical Materials

1. A complete rectifier equipment, including switchgear, transformer, and rectifier, contains from 25 percent to 30 percent less critical material than equivalent rotating conversion equipment with switchgear.

Efficiency

A comparison of the kw. losses and approximate overall efficiency of the three standard types of conversion equipment is shown in Figs. 6 and 7. The curves are more or less self-explanatory but it should be noted that most mining equipments operate at a load factor somewhat below 50 percent and therefore, the higher efficiency of the rectifier equipment at light load is advantageous.

Power Factor

Characteristic power-factor curves of rectifier equipment, both with and without phase control, are shown in Fig. 8. It should be noted that the power factor of this equipment is lagging but is comparable with the average system power factor at most mines. Capacitors may be furnished with this rectifier equipment if better power factor is required. Of course, where leading power factor is required, motor-generator sets can be furnished with .8 power factor leading synchronous motors. These motors will furnish corrective k.v.a. to the

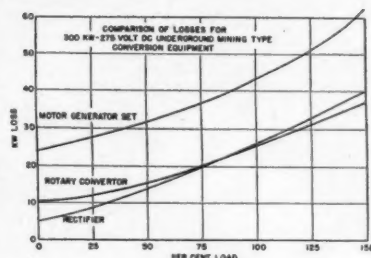


Fig. 6

system. However, most mining systems have a substantial synchronous load in motor-driven fans and pumps connected on the line and these motors generally furnish sufficient corrective k.v.a.

Voltage Regulation

The output voltage characteristics of the rectifier may be flat, shunt, or overcompounded by the use of proper elements, thus equalling all the characteristics obtained from MG sets.

Wear and Deterioration

Dust and dirt cause wear of the commutator, bearings, and other rotating parts of MG sets and rotary converters. The dirt collecting on the windings of the equipment causes deterioration and subsequent heating. The rectifier equipment has no major rotating parts and all of the major devices are enclosed with the exception of the d.c. line switch and contactor. The usual amounts of dust and dirt do not affect the operation of these two devices and it is merely necessary to blow them off from time to time.

Noise

Since the rectifier equipment has no major rotating parts, noise is reduced to that of the small cooling fan and pump, and the slight transformer hum.

Maintenance

Maintenance of a complete rectifier equipment consists of normal maintenance on the control and switchgear components, checking the level and quality of the Pyranol in the rectifier transformer, adding small quantities of make-up water to the heat exchanger, and replacement of any defective parts in the complete equipment. It should be noted that the

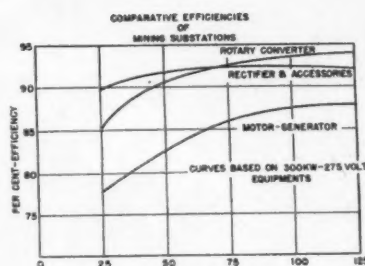


Fig. 7

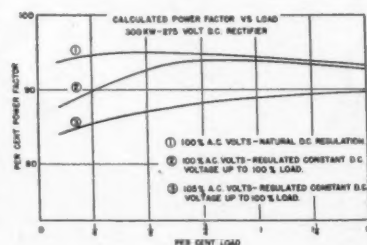


Fig. 8

sealed ignitrons carry a warranty covering two years shelf life, plus three years operating life. Present-day records obtained from operators who are now using this type of equipment show evidence of sealed ignitrons that have been in service for as long as 4½ years and are still operating. It is anticipated that the life of these sealed ignitrons will exceed the warranty in most cases.

Conclusion

The rectifier has many characteristics, which have been previously discussed, that make it applicable to mining service. Operators, who are now using this type of equipment, express complete satisfaction with its characteristics and operation. It is not a cure-all, nor is it going to supplant all MG sets and rotary converters. It is another tool that may be used to accomplish the conversion of alternating current to direct current and the final choice rests squarely in the hands of the operator, who must weigh the facts and determine which equipment will best fill his needs.

Preventing Welding and Cutting Fires

To instruct users of welding and cutting equipment in reducing potential fire losses, the International Acetylene Association has prepared a convenient, 16-page, pocket-size booklet entitled "Preventing Welding and Cutting Fires." Written in easy-to-understand style, this booklet contains

brief, clear discussions of the chief causes of fires and practical, common-sense measures for preventing them. It may be obtained in reasonable quantities without charge directly from the International Acetylene Association, 30 East 42nd Street, New York 17, N. Y., or from any manufacturer of oxygen, acetylene, carbide, or welding and cutting equipment.



***Mining Men Will Discuss Industry's Problems and Map Program
for Future at Denver, January 27, 28, 29***

PRESENT production problems and plans for the future of the western mining industry will be keynoted at a joint meeting of the American Mining Congress, Western Division, and the Colorado Mining Association, to be held in Denver, January 27-28-29. The regular fall meeting of the Congress was postponed last year to mid-January, and the decision to merge it with the Annual Meeting of the Colorado group has met with whole-hearted approval by western mining men.

Charged with the responsibility of supplying an unprecedented demand for the metals and minerals vital to victory, the mining industry has met the Nation's needs, and shortages which threatened to hamper arms production have been overcome. In view of changing military requirements, the time has now come to take stock of the present situation, and to consider the industry's needs in carrying through to a successful conclusion of

the war, as well as in the transition to a peacetime basis.

At the Denver conference, mining men from all parts of the West will discuss the present status and outlook for the industry; manpower problems; metal prices and quotas; equipment and supplies; exploration and development to replace depleted ore reserves; mining's rights on the public domain; the stockpiling of metals and minerals; gold mining and the future of gold and silver; Federal taxation, and other subjects of pressing importance. High ranking officials of the War Production Board, the armed services, the War Manpower Commission and other government agencies will meet with the industry, to consider requirements and future policies. National issues will be discussed by members of the United States Senate and other public officials.

Arthur H. Bunker, newly appointed WPB Vice Chairman for Metals and

Minerals, will address the meeting on the mineral policies of the War Production Board. The requirements of our armed forces will be discussed by Brigadier General Clarence H. Danielson, Commanding 7th Service Division, and by an officer from the Production Branch, United States Navy. These three addresses will serve to show the over-all picture of our country's needs and the position of the mining industry in the war program.

Brigadier General William C. Rose, Chief of Executive Services, War Manpower Commission will discuss the important subject of manpower for the mines. General Rose is well acquainted with mining's problems, and the industry may look to a candid statement of the over-all manpower situation and of measures taken or contemplated to maintain the required production levels.

One of the important features of the meeting will be a symposium on the current status and outlook for the

principal metals, by well-known industry leaders in each field. This look-see into the present and future of each branch of the industry will be followed by three special evening meetings at which WPB officials will talk informally and answer questions concerning Government policies on mineral production. The first of these group meetings will be devoted to copper, lead and zinc, another to the ferro-alloy metals, and the third to quicksilver, fluorspar, gold, silver and miscellaneous minerals.

Director A. S. Knozen of WPB's Mining Division will speak on the problems of supplying adequate machinery and materials to keep the mines operating, and will hold a special roundtable conference with mining equipment manufacturers to consider the procurement of material, equipment scheduling and post-war adjustment problems.



ROBERT M. HARDY, Chairman
Western Division, American Mining
Congress

At an opening luncheon on January 27, Hon. Pat McCarran, U. S. Senator from Nevada, will outline public land questions, with special reference to recent restrictions upon the long established right of mineral location and entry, and the proposals to extend a leasing system to all minerals. The future of the domestic mining industry in competition with low cost foreign producers will be discussed by Dr. John Lee Coulter, outstanding economist and former member of the U. S. Tariff Commission.

The need of a stockpiling program, to insure adequate supplies of metals and minerals against a possible future emergency, and to prevent demoralization of mining operations through the dumping of accumulated surpluses following the war, will be presented by Senator James G. Scrugham of Nevada, author of legislation designed to accomplish this end. Special tax problems of the mining industry will be covered by a panel of mine operators and tax advisors intimately

familiar with the practical effect of present Federal tax laws and regulations upon the development and operation of mines.

Other important features of the conference will include a forecast of the roles of the light metals and the heavy metals in the post-war economy; a series of presentations on the work of the U. S. Geological Survey in exploring for and developing mineral reserves; an analysis of the trend in labor relations by an authority in this field; a discussion of the premium price plan for copper, lead and zinc; presentation of the small mine operators' problems; and straight-forward statements on the gold mine situation and the prospects for gold and silver.

The traditional "Silver Banquet" will be held on Friday evening, January 28, and the world famous "Sowbelly Dinner," at which the Honorable A. B. "Happy" Chandler, U. S. Senator from Kentucky, will be the guest speaker, will climax the meeting on Saturday night, January 29.

While this conference is primarily a business meeting of the mining industry, there will be ample opportunity for all those attending to hobnob with their friends of the mining fraternity in the hospitable atmosphere of Colorado. Everyone having an interest in the industry's welfare and prosperity is urged to attend.

Robert M. Hardy, president of the Sunshine Mining Company, Yakima, Wash., has been unanimously elected chairman of the Western Division of the American Mining Congress and together with Howard I. Young, president of the American Mining Congress, will take an active part in the meeting. Charles N. Bell, Ouray, Colo., is president of the Colorado Mining Association. Harvey L. Tedrow, who has been manager of the London Gold Mines, Alma, Colo., is chairman of the General Committee, and B. T. Poxson, of Denver, is vice chairman. Other committees include: Sowbelly Dinner, A. Roy Wicker, manager, Western Machinery Co.; Silver Banquet, C. J. Abrams, general superintendent of the Climax Molybdenum Co.; Reception, Frank P. Conroy; Housing and Hotels Committee, Lloyd Wilkins; and Credentials Committee, Walter E. Scott, Jr.

An Advisory Committee of leading Colorado mining men consists of James Q. Newton, Thomas A. Dines, W. Harry Leonard, H. C. Van Schaack, Charles Tutt, George H. Rupp, Wm. J. Coulter, Dr. John Wellington Finch, William V. Hodges and John Evans.

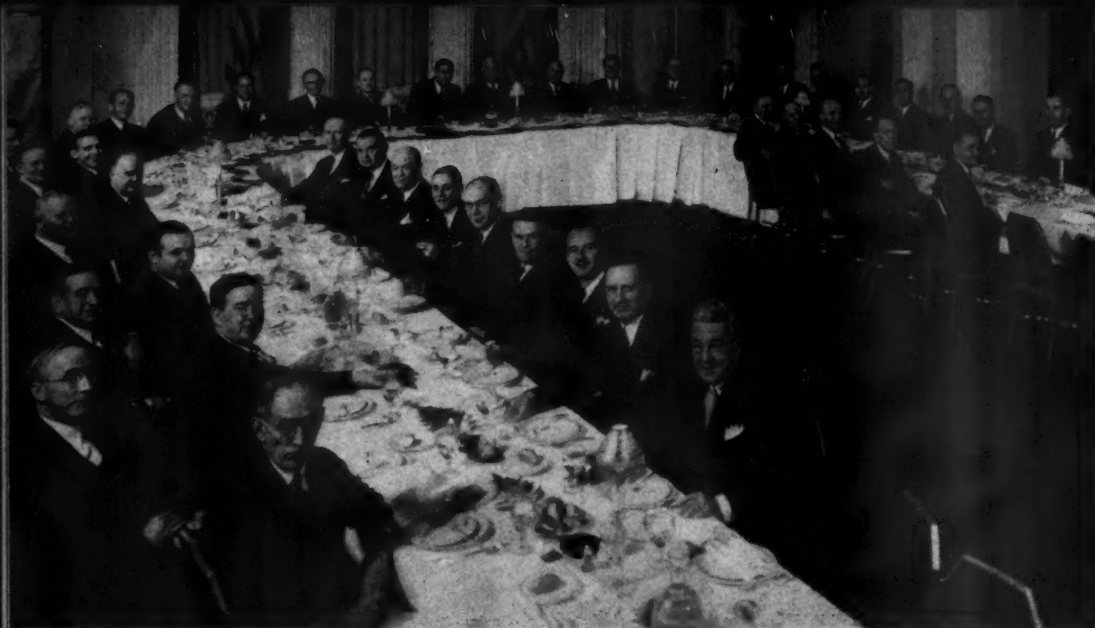


HARVEY L. TEDROW, General
Chairman, 1944 Convention
Committee, Colorado Mining Assn.

Entertainment for ladies will be in charge of a committee of which Mrs. Verner Z. Reed is honorary chairman. Mrs. C. L. Barker, active chairman, and Mrs. Arthur Lucas Jones, vice chairman.

A large general committee working actively on the various arrangements for the meeting, under the direction of the various committee chairmen and coordinated by Colorado Mining Association Secretary Robert S. Palmer, includes: Oscar H. Johnson, Edward D. Dickerman, Alex McLellan, C. L. Martin, William Buckley, J. G. McKenzie, Arthur F. Mayham, M. I. Signer, Gerould A. Sabin, Ray Summer, J. Clair Evans, Harvey Mathews, Paul D. Steele, Harry M. Williamson, Harry D. MacDonald, Paul Bennett, Joseph P. Ruth, George O. Argall, T. A. Dickson, Frank E. Briber, W. J. Morris, Clifford I. Parsons, H. E. Dillon, G. W. Gunderson, F. S. Eagle, Charles W. Jordan, William B. Freeman, Edward Thornton and James N. Flood.





Mining Congress Activities In 1943

*Annual Report of Julian D. Conover, Secretary, at
Members' Meeting, December 15, 1943*

THIS 46th Annual Meeting of the American Mining Congress marks the close of one of the most strenuous years in nearly half a century of service to the mining industry. The problems of mining in this second year of the war have been complex, have brought more mining men than ever before into contact with the agencies of the Federal Government, have called to an increasing extent for attention and hard work on the part of your organization.

Our President, Mr. Young, has been in the center of the picture in Washington, where he has had a major responsibility for the general policies and programs relating to minerals. He is patriotically performing an arduous task calling for rare ability, intelligent understanding and sound judgment. The significance and value of his work, both to the mining industry and to our country at war, can hardly be overestimated.

The past year has witnessed a gratifying increase in membership and support from all branches of the industry, and a continuance of close relationships with the various regional and State mining associations whose

officers and thousands of members are a potent force in our national work.

The 1943 War Conference of our Western or Metal Mining Division, planned for November, was deferred to January, and at the invitation of the Colorado Mining Association will now be held as a joint meeting with that body. This meeting, at Denver, January 27-29, will be given over to full discussion of the problems of western mining by industry leaders, in conference with war agency officials and Congressional representatives from the mining States.

At that time also the regular round-table conference of the State mining association officials will be held. The fine cooperation developed between these organizations in recent years means a great deal to mineral producers. During the past year we again conducted, at their request, an exchange of information on matters pending in the State legislatures, to assist them in warding off attacks on the industry.

Our Coal Division today has nearly 200 men actively participating in the work of the Committees to develop improved practices and use of equip-



Julian D. Conover

ment. Its meeting at Cincinnati and Pittsburgh were further milestones in 20 years of work for the modernization of coal mining operations. Had it not been for this work, pioneered and led by the American Mining Congress, the mines today could not possibly supply the enormous tonnages of coal required by our war and civilian industries. At these meetings, also, major problems of manpower, priorities and Government operation of the mines were considered.

Our Manufacturers Division, reorganized in 1942, has continued to grow, and now includes 123 of the leading equipment manufacturers supplying the coal, metal and non-metallic mines. This Division's active

support has been of the greatest value in our efforts to serve the mining industry.

Concerning our work in Washington I will try to be brief. I could not possibly discuss all aspects, and will merely outline some of the important matters as to which we have either taken the lead, or have cooperated with members of the industry, with members of Congress, or with officials of the Government agencies, in protecting mining's welfare. These include:

Tax Legislation

A subject constantly before us. Due recognition of mining's needs becomes ever more critical as tax rates approach confiscation. Unless depletion allowances, excess profits credits, and relief provisions are adequate and are equitably administered, mines cannot retain sufficient funds to make good the rapid exhaustion of present reserves and the deterioration of plant and equipment. We have striven to present these needs of the industry.

Under the Withholding Tax Act of 1943 our principal concern was to simplify the complicated system of deductions first proposed, with different rates of withholding and varying exemptions, which would have imposed a staggering burden in preparing payrolls. This was largely accomplished insofar as employers are concerned, though the Act contains many complexities for individuals which have not yet been removed.

Two special tax measures helpful to mines were passed. One extends to three years the time for filing applications for general relief under Section 722, where conditions in the base period do not give an adequate standard for normal earnings. The other (Disney bill) grants exemption from excess profits tax to bonus income on production from mine tailings.

In the pending Revenue Bill, percentage depletion was spared a further direct attack through action by the Ways and Means Committee to exclude testimony on this subject. On the other hand, the House bill provides that following the war, percentage depletion allowances shall be discontinued in the case of fluor spar, potash and other minerals to which this right was recently extended. We are supporting an amendment to strike out this termination clause.

Our Tax Committee, under Mr. Fernald, has met frequently. It has made exhaustive study of the effect of existing law and regulations on mining and has made careful recommendations to Congress, for consideration in the pending bill if possible, or in further legislation next year.

The committee, its subcommittees and individual members, and the staff have been active in all these matters,

—particularly in protecting percentage depletion provisions; in pressing for a clear-cut definition of "Gross Income from the Property" upon which the percentage depletion allowance, the strategic mineral exemption, etc., are computed—as contained in the amendment sponsored by Senator Johnson of Colorado; in presenting a similar definition of "Net Income from the Property"; in working with the Treasury and with Congress to obtain the full benefit of the exemption on bonus income; in seeking to extend the "exempt excess output" provisions to new mines and to lessors, and to obtain a suitable definition of the term "mineral property"; in urging full deduction of all development expenses subsequent to initial discovery, as operating costs; in asking that adequate provision be made for undermaintenance, underdevelopment and accelerated depreciation; in opposing further increase in excess profits taxes and in payroll taxes for Social Security; and in advocating certain necessary technical amendments.

Mr. Fernald has again performed an outstanding service in coordinating and directing this work and in presenting the industry's needs.

Renegotiation

The exemption from renegotiation of contracts for mineral raw materials not refined or treated beyond the first industrial state, and the joint regulations defining this, have been continued without change. In the House Committee hearings the RFC criticized this exemption, but the House did not concur, and in the Senate the RFC has asked only a limited authority to renegotiate certain toll contracts and contracts involving operation of Government-owned plants. Continuance of the raw materials exemption is highly important both to the mining and smelting industry itself, and to manufacturers of mining equipment, whose sales to the mines are thereby made non-renegotiable.

Stockpiling

Mindful of the dangerous shortages of certain minerals which have at times threatened to bog down munitions production, and likewise of the dumping of surplus metals after the last war which brought demoralization to the mining industry, our Board of Directors last February considered carefully the need for a post-war stockpiling program.

We have advocated legislation to freeze post-war stocks of war metals and minerals as a permanent reserve against a future military emergency; and to accumulate further supplies to the extent needed for national security—taking the position that in this program adequate consideration

should be given to the needs of domestic producers who have contributed so wholeheartedly to the war effort.

Unfortunately, action on stockpile legislation—including the most recent bill, S. 1584, by Senator Scrugham of Nevada and four of his colleagues—has thus far been stalled by controversy over the administrative set-up and over the respective roles of domestic and foreign acquisitions. We have further urged that such legislation provide for the freezing of all surplus supplies of war metals, including scrap and materials in process.

Enactment of an adequate stockpile program would go far to meet some of the most pressing problems of the metal and mineral mining industries in the immediate post-war period.

Foreign Trade Agreements

Another major problem of domestic producers for the future is that of tariff protection. Last spring, carrying out policies repeatedly declared by the American Mining Congress, we opposed a blanket three-year extension of the Reciprocal Trade Agreements Act. We took the position that any trade agreements should be open to review by Congress before becoming effective; that, in pursuance of the policy originally set forth by the State Department, tariff concessions on any commodity should be made only to the country which is the principal source of imports; that the "escape clauses" should be mandatory, and that provision should be made for adequate review and correction of injury done to domestic producers. We pointed out that sound national policy demands the maintaining of our mining industries in healthy condition, and that this cannot be accomplished under a program which trades away needed tariff protection without proper safeguards and without adequate recourse in case of demonstrated injury.

Despite strong sentiment for such safeguards, a war psychology resulted in extension of the trade agreements authority without substantial change, although the period of extension was cut from three years to two. The Act was further restricted in that the most-favored-nation treatment may be withheld from countries participating in international cartels to the disadvantage of American trade.

St. Lawrence Project

The St. Lawrence waterway and power project, successfully opposed two years ago, is again becoming active. Authorizing legislation has been introduced in both Houses and hearings are to be held shortly by a Senate Committee. The harm which this Government-subsidized project would do to the coal and iron ore industries, and its discourag-



ing effect upon the development of processes for treating lower grade iron ores essential to our future industrial strength, are matters of compelling concern which will again be presented strongly to this committee.

Public Lands Of deep concern to the mining industry of the west are the proposals to extend the leasing system to all minerals on the public domain. Two years ago the Interior Department definitely advocated such a program, which we then vigorously opposed.

This year the Hatch bill, requiring the recording of placer claims for deposits of phosphate, sodium, potassium, oil, oil shale or gas, contains a provision that regardless of such filing, the validity of the claims "shall remain open to inquiry and determination upon such procedure as may be prescribed by the Secretary of the Interior, or in any other lawful proceeding." This broad and undefined authority to place existing claims in jeopardy is alarming, particularly as it might set a precedent in the case of metalliferous mining claims. We

stand determinedly against such legislation.

The movement to abolish the established mining laws and to substitute a leasing system for all minerals is one which will require continued and vigilant opposition. Likewise we shall continue to oppose the unwarranted withdrawals of large areas of public lands for single-use purposes, which unduly restrict the right of location and entry for purposes of mineral development.

Senator McCarran of Nevada has performed a public service in focusing attention upon these matters in recent western hearings to investigate the administration and use of public lands.

Manpower Manpower has continued to be a No. 1 problem, although various measures have been taken to protect and augment the labor supply for the mines.

The deferment directives of Selective Service, prepared in conference with our office last year, were later reissued and strengthened by the War Manpower Commission. In the western states draft officials were further instructed to treat all men employed in non-ferrous mines as eligible for deferment, whether skilled or unskilled and whether deferment requests had been filed or not. The furloughing of an additional 4,500 men from the Army served to alleviate some of the more critical labor shortages. On the other hand, efforts to obtain a substantial number of Mexicans for the mines of the southwest continued unavailing.

The mining industry in general was relieved of the necessity for filing replacement schedules, it being shown that such schedules were impractical due to an over-all shortage of manpower. Of some help to the industry also were the "freeze" orders covering essential workers, the 48-hour week order, the issuance of a new list of "super-critical" occupations which included 39 key occupations in mining and smelting, and specific instructions to the U. S. Employment Service to coordinate its efforts with Selective Service and to give mining operations a No. 1 priority in the recruitment of men.

More recently steps to provide manpower for coal mines have been taken through instructions to operating managers to request deferment of all mine workers and to follow through with the proper appeals procedure; also through a recruitment drive, both for experienced miners and for new men who can be trained to do the job.

In passing, we may note that several State laws to correct abuses in the activities of labor unions were enacted this past year. This is a significant development in the consistent efforts made by mining and other in-

dustries to remedy the one-sided character of the National Labor Relations Act—to place the Government in its proper position as an impartial conciliator in labor disputes and to hold employes and employers alike responsible before the law for their actions.

We have also supported a proposed law which would bar supervisory employes from membership in unions, a matter which has been of serious concern especially to the coal industry.

Priorities Materials procurement problems of the mines and equipment manufacturers have called for continued attention. Ever since issuance of our original P-23 preference rating order in July, 1941, priority controls have multiplied and frequent revisions have been needed to preserve recognition of the mining industry's basic importance. The Mining Division of WPB has handled these complex problems with extraordinary energy and ability, and we have worked closely with them at all times.

Special treatment of the mining industry under our basic P-56 and P-73 orders has been maintained, and mine and smelter operators have been kept free from the complicated provisions of CMP. Manufacturers' production has been placed under scheduling to insure an adequate supply of replacement parts. Relief is being obtained from some of the burdensome "L" and "M" limitation orders. The system of quarterly quotas has been liberalized, to permit advance buying for subsequent quarters, and beginning with 1944 quotas are to be on a 6-months' basis, thus reducing paper work and simplifying procedure.

It is also anticipated that permission will be given shortly to make limited purchases of capital equipment items through merely an endorsed rating, without obtaining specific clearance, thus further speeding up the buying of needed equipment. Non-serialized smaller mines have been given improved ratings for purchase of repairs and supplies. Shortages of certain critical items, such as rubber-covered cable, wire rope, tractor parts, motors and generators, and steel plate, have been dealt with and a reasonably comfortable situation now exists.

Through our bulletins we have made prompt report to the industry of all changes in purchasing procedure. Special conferences with the Mining Division were held at our Cincinnati meeting and are also planned for the Denver meeting in January. The Advisory Committees of manufacturers and mining men, with whom we have been closely associated, have kept the Mining Division informed of conditions in the industry and have assisted in keeping the mines running.

Gold Mines Limited relief from the arbitrary gold-mine closing order, L-208, has been granted in a considerable number of cases, but is still urgently needed for other mines which have heavy maintenance expense and which should be allowed to operate at least at a sufficient rate to cover stand-by costs. Full scale operation should be allowed at the earliest possible date.

We are also supporting legislation under which mining companies prevented from undertaking or carrying on operations by Order L-208 or other Federal regulations could obtain court relief from certain contractual obligations.

Silver Accord was reached between silver users and producers when the Green bill was passed in June, making Treasury silver available for industrial use at the established price of 71.11 cents per ounce, and requiring retention by the Treasury of sufficient silver to cover outstanding silver certificates.

Following this action, Congress refused to adopt the Celler amendment to the Treasury appropriation bill, which would have denied funds for the administration of existing silver legislation.

Government Questionnaires At the request of the Bureau of the Budget, a mining subcommittee on Government questionnaires was organized by our of-

fice early in 1943, to recommend reduction and simplification in the forms used by Federal agencies. This committee has been successful in eliminating several report forms and condensing others, thus relieving mining companies of some of the excessive burden of clerical work.

Assessment Work The requirements for annual assessment work on mining claims have been suspended for the duration of the war under a law enacted last spring. Having in mind the manpower shortage, we asked that the previous provision limiting such suspension to six claims held by an individual or 12 claims held by a corporation be dropped; and the present law contains no such limitation.

* * *

To give a detailed report of all the activities of the American Mining Congress would require far more time than we have available. Other matters calling for attention have included:

Metal prices and quotas; including the authorization of higher premium prices early this year and the clarification of recent statements of policy regarding the stimulation of new production;

Buying depots and stock piles for strategic minerals;

Freight rate increases and the transportation tax;

Assistance to the mining subcommittee of the Senate Small Business Committee in its study of the problems of small mines;

RFC mine loans;

Access roads—for which an increased appropriation was made;

Adequate meat rations for miners; Resumption of block leasing in western mines;

Minimum wage under the Wage-Hour Law;

Application of the President's overtime order, and the wage and salary stabilization orders;

Removal of unnecessary restrictions on mineral statistics;

Contract termination procedure;

Scrap salvage;

And many other matters either of general interest to the industry, or as to which mining men have sought our assistance.

Our Weekly Bulletins have carried summaries of Washington developments affecting the mining industry, both in legislation and in the work of the many Federal and wartime agencies. Contact between our office and mining men throughout the country is probably closer than it has ever been. Although our staff has not been expanded in size, we have endeavored to meet the wartime load, and we are glad to have this opportunity to be of service.



Reducing Absenteeism and Turnover

THERE IS no single panacea for curing absenteeism and turnover, unless it be a willingness on the part of mine management to view the problem scientifically and to take whatever steps are necessary to correct the underlying causes. In fact, excessive absenteeism and an abnormal turnover are not *diseases*; they are *symptoms* of a malady which is amenable to treatment. Your mine may be suffering from several varieties concurrently—and there is little use applying a single over-all remedy or corrective measure in the hope of solving the general problem.

Of course you know *how many* miners were absent during a given period of weeks or months. But do you know how many were absent *for what reasons*? If you have records which show the reasons, then you can begin to take corrective measures. For instance, one large company keeps a punch-card record of absences, and every employe has a card. On it are spaces for recording the following 12 types of absences:

1. With permission.
2. Without permission.
3. Employe ill.
4. Mine accident.
5. Outside accident.
6. Vacation.
7. Company business.
8. Suspension.
9. Personal reason.
10. Illness at home.
11. Death in family.
12. Out of town.

It is immediately apparent that some of these causes of absenteeism can be mitigated, if not entirely eliminated—and that it is management's responsibility to do the mitigating. If, for instance, the trend is toward too many absences "with permission," then something needs to be done to restrain the persons who grant the permission. If illness is the cause of an abnormal amount of absenteeism, either the company health program or the community health machinery—or both—will stand scrutiny. Accidents can be reduced through safety education. Too great a number of absences due to suspensions invites the criticism that the power to suspend is being used unwisely. And so it goes, right down the list.

In other words, this breaking down of absences makes it possible to delve into causes. *Why* are so many absent with permission? *Why* are so many

Analysis of causes advanced as essential in dealing with problem

By O. C. COOL

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employees ill? *Why* do we have so many accidents? *Why* were vacations scheduled in such a way as to deplete effective manpower? *Why* does "illness at home" make so many workers absent or tardy? What personal reasons are advanced, and why are absences for such reasons necessary?

When management begins to ask these questions, and to get the answers, then it has taken the all-important first step in solving its absentee problem. It has also come to realize that flag-waving and appeals to patriotism—or, what is worse, slurs on the workers' eagerness for victory—are sure to be exactly what the doctor *didn't* order.

Here is a four-point program for attacking the absentee problem (and when you have adopted it you will find turnover greatly lessened—because the same reasons which cause an employe to stay away now and then very often are the reasons why he leaves the job in the end):

1. Determining the reasons.
2. Correcting the causes.
3. Applying penalties.
4. Devising incentives.

The first step in determining the reasons for absenteeism is to *formalize* the procedure for admitting the employe back to work. Don't wait until the payroll figures come through to realize that Joe Smith was out on Monday. The time to act is when he reports for work on *Tuesday*. Install some automatic, impersonal machinery for making Joe *apply for admission*; don't let him start work until he gives his reasons. Not just to his supervisor, either—but to some one whose authority means immensely more. Delete entirely any *casual* approach or handling. Here is a good way to do it, as established by the field staff of the Institute:

When a man fails to show up for work after a given grace period has elapsed, remove his time card from the rack and substitute a red notice which tells the worker where he must

report to get his card. This should be done, of course, only in those cases where the worker is absent without authorization. Some companies have found it helpful to have "A.W.O.L." printed in bold letters on the notice. The employe takes the notice to the proper executive—the personnel director, mine superintendent, or other person in charge of the program—and is required to give his reasons for the absence before his time card is returned. This information should be written down and made a part of the employe's official record. Then when it ultimately comes to light that Joe has been absent "for personal reasons" too many times in too short a period, the record itself will stand in judgment.

Some companies require returning absentees to go before a special committee comprised of an executive, a union steward, and another employe. Many workers find it harder to face such a group, because he knows that the employes on the committee will make short shift of any trumped-up excuses. Of course, a report is duly made out; the committee retains one copy and sends another to the personnel manager for further checking and compilation.

But the absentee problem will not be solved simply by hearings and interviews. What is necessary is to go *behind* the reasons given by the returning workers in order to correct the basic causes. For instance, excessive drinking following payday is one of the most serious factors. Investigation by Institute field men has often disclosed that employes have nowhere to cash their checks except in taverns and bars. That, of course, leads to buying drinks and joining the crowd. The solution is either for the company to set up its own check-cashing service or else arrange with a local bank to stay open one evening a week.

Most of the other excuses given by absentees, if they are sincere, disclose ways and means of removing the causes. "Personal reasons" may

include consulting a lawyer regarding some family or neighborhood squabble which could be solved by an advisor in the personnel department. It may be that shopping for clothing involves a trip away from town, because of limited local assortments. In rural localities, where the miner may run a small farm, a sick animal or a sudden hazard to his crops may require emergency attention. The county agricultural agent may have some suggestions about what to do in regard to such cases.

"Illness in the family," particularly if it is the wife who is sick, is a genuine problem for the worker. Now that there are fewer doctors available, waiting for the physician to arrive may involve a long ordeal. And with so many women working themselves, there are fewer helpers to "come in" and tend the patient. Adequate home-nursing service is the best answer to this difficulty.

Rumors about the company and the employees' jobs frequently are the cause of absenteeism. If for some groundless reason the fear of extensive layoffs spreads, workers will take time off to look for new jobs. "Grievance" rumors are another dangerous type. A man who has been turned down on some complaint may beef about it to others, making the company or its executives appear unfair. The best way to defeat any rumor is to bring it out into the open and cite the facts. Editorials in the company magazine or messages to the workers can help by discouraging loose talk and shaming the employee who listens to or spreads unfounded information.

Some companies have tackled this problem in still another way—by setting up "rumor boards." These are a type of bulletin board equipped with a small box filled with paper slips on which is printed "I have heard today that ———." The slips are collected twice a day and the answers posted on the rumor board. A bad variation of this device is the appointment of "rumor wardens," who are supposed to report harmful bits of gossip which are floating about. The danger is that the "wardens" may be confused with company informers, thus causing resentment and creating new grievances—leading in turn to greater absenteeism.

Adequate grievance machinery is one of the most effective antidotes to absenteeism and excess turnover. No matter how trivial a complaint may seem to the person who handles it, the complainer still regards his grievance as just. If there is no outlet for the dissatisfaction it may smoulder under the surface—and then suddenly flare up. Even having the right to voice the complaint removes a good part of the trouble—and if the grievance is well founded its cor-

rection may create good will and prevent other workers from experiencing similar dissatisfactions.

Penalties for Absenteeism

Employers are coming to realize that penalties should be a last resort. Really *inexcusable* absences are in the minority, and when one does occur it should be viewed against the employee's record of attendance. Frequently a mere warning is sufficient. If a second inexcusable absence occurs, the employee may receive a second warning, reminding him of the previous lapse. This warning may properly contain a notice to the fact that an additional breaking of the rules will lead to discharge. And if the lapses continue, to a point where the company has no other alternative but to fire the worker, the discharge notice should describe the series of offenses, citing the dates. A copy should be kept on file to prove the justice of the action, should it be questioned later on.

Some union contracts provide for pay deductions as a means of preventing absenteeism. A recent clause approved by a Regional War Labor Board permits deductions for "frivolous" absences which have continued despite all other attempts to curtail them. Deductions are computed on the basis of 25 working days a month, and each day's unexcused absence results in a deduction of one-twenty-fifth of the employee's pay for the month. This device, of course, is of use only in regard to salaries or wages which are paid for a *period*, and not for time actually worked.

The important thing regarding any type of penalty is that it must be *reasonable*. If it is too severe for the infraction, or if it is arbitrarily imposed without giving the worker a chance to state his case, the result will be bad, and it may lead to other difficulties.

Rewards for Perfect Attendance

Honoring and rewarding workers with good records is a more positive treatment of the absentee problem. If the rewards are tangible and not just "recognition"—which is good in small doses well spaced apart, but decreases in value with repetition—the good effect may be measurable. Under a plan recently approved by the War Labor Board, employees may participate in war bond drawings designed to curb absenteeism. This arrangement consists of a lottery in which employees who have perfect attendance records over a given period may participate. The prizes may be \$25 or \$50 bonds. There is a definite limitation on the *total* amount of bonds which can be given away—they must not exceed 1 percent of the payroll for that period.

This device has considerable merit, in that it increases the winners' "take-home" pay. But approval of the War Labor Board is required before such drawings can be held, or else they will be considered a violation of the Wage and Salary Stabilization Act. *Cash* awards, either in the form of lottery prizes or as outright bonuses for good attendance, are *prohibited* by the regulations.

Exit Interviews Reduce Turnover

Experience has proved that one of the best ways to reduce turnover is through the so-called termination or exit interview. Whether an employee is being discharged or is quitting of his own volition, before he checks out the personnel director or some other management representative should have a chance to get at the root of the trouble and attempt to straighten out matters at the very last moment.

Most employees will talk freely if the interviewer wins their confidence. If the worker seems reluctant to express his real sentiments, a few pointed questions may arouse him to "tell all." The disgruntled or sullen employee may be approached even more directly, as by asking him if the job is too big for him, or if he thinks he knows more than the foreman. If this is done skillfully the man probably will be quick to defend himself, and will divulge his true reasons for leaving. But the challenge technique must not be pressed to a point where it builds up resentment against the company.

It frequently happens that the facts disclosed by exit interviews lead to correction of situations which, unremedied, would accelerate the turnover. In that sense, exit interviews pay huge dividends upon the time invested.

Naturally, *all* wisely based moves to correct unfavorable conditions which are the underlying causes for absenteeism and high labor turnover are profitable in the end. But the starting point is a desire on the part of management to do its share to eliminate or reduce the conditions which are within its control.



Geology Through A Stereoscope

Mapping from aerial photographs takes its place as a standard surveying method, and its general adoption by our armed forces promises even greater scope.

IT SEEMS STRANGE that out of periods of carnal destruction should spring new methods of charting and topographic mapping, because charting and mapping of any kind are so closely aligned with the advancement of science, public welfare, expansion, development, and exploitations.

The development of the airplane and air camera during World War I (1914-1918) revolutionized methods of topographic mapping. Mapping from aerial photographs has taken its place among our standard surveying methods, and the impetus given to the art due to its universal adoption by the armed services on every front, bids fair to materially enlarge the scope and popularity of this newest of surveying methods.

The development of resources in the hinterland, far beyond the reach of ordinary ground survey methods, can now be planned from maps compiled by photogrammetric methods using a limited number of astronomic observation stations.

In the very near post-war period, it is very important that we mobilize all the available resources of this world, to enable them to be exploited to the best advantage. Aerial mapping methods are the only means we can use to give the over-all picture of exploitable timber, mining, water power, and transportation possibilities.

Aerial mapping is somewhat more than just taking pictures. They must be good pictures, taken from known altitudes, with a known focal length camera and in sequence. From this information, the scale of the photographs can be computed as follows:

In figure 1, f =focal length of camera. H =altitude of plane.

S =Scale=Ratio Print Distance to Ground Distance= $\frac{PD}{GD}$

From similar triangles we get the relation: $\frac{f''}{H'} = \frac{PD''}{GD'}$

$$S = \frac{f''}{H'} = \frac{PD''}{GD'}$$

$$\text{Example: } f=10'' \quad H=4000'' \quad S = \frac{10''}{4000''} = \frac{1''}{400''}$$

$$\text{Scale of print: } 1''=400''$$

What ever purpose the aerial survey was made for requires photographic interpretation. This calls for

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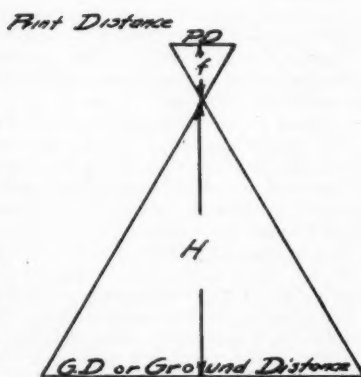


Fig. 1

highly skilled personnel; operators, who are trained in the uses of the stereoscope and interpretation of the resulting spacial model, operators who understand the study of light and shadow, because in studying single photographs or stereo pairs, they are viewing terrain from a new angle. Hitherto, they have viewed the surrounding territory while close to it and

in photogrammetry they view it from the height of the camera.

The geologist, mining and petroleum engineer, because of the very close association with the surface appearance of the earth, must be extremely careful in orientation of prints, stereoscope set-up and resulting interpretation.

The important thing in regard to photo interpretation is proper set-up and orientation of the prints. Let us consider two adjacent prints taken in the line of flight with the required overlap (50%-60%). Each print will have four collimation marks, one at the center of each side.

With the use of a straight edge and a sharp pointed instrument, connect the two opposite collimation marks. At the intersection of these two lines, make a small cross. This point is exactly the center of the print and is called the principal point or mechanical center. (See Figure 3.) It is necessary to prepare both prints in this manner.

Lay the prints down, and by matching detail, make the proper overlap by placing the right hand print, or



Fig. 2
Military student
studying photo
interpretation
with Abrams
CF-8 stereoscope

print 2, on top of print 1. This latter step is done in order to have the prints in proper sequence.

It will be seen that the principal point of print number 2 can be identified to the right of the principal point of print 1. Place a small dot at its proper location. The principal point of print number 1 can be identified to the left of the principal point of print number 2. (See Figure 4.)

The next step in proper orientation is the establishment of the stereoscopic base. Using a straight edge on print number 1, draw a thin straight line from the principal point to the transferred position of principal point 2. The same procedure should be fol-

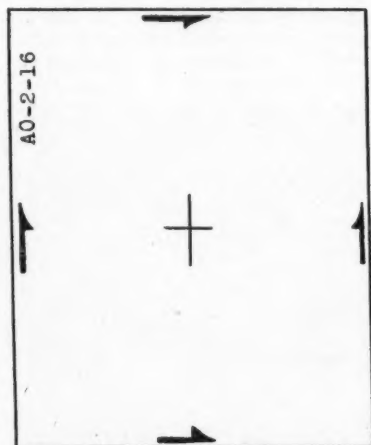


Fig. 3. Collimation marks and principal point

lowed with respect to print 2, extending both lines to the edge of the print.

Now lay both prints down in their former overlapped position and adjust them so that the principal point of print number 1 and its transferred position on print 2 are about $2\frac{1}{2}$ in. apart and the base lines in each print appear as an extension of the line on the other print. (See Figure 5.)

Tape the prints down firmly at the corners, the orientation is complete and, with the stereoscope adjusted for interpupillary distances, we are now ready for stereoscopic study. We must remember, however, to keep the longitudinal axis of the stereoscope always parallel to the stereoscopic print base.

As soon as the prints are oriented, a stereoscope can be placed on the prints parallel to the base line, with the lenses directly over like detail. A model of "third dimension" will readily appear when the prints are viewed through the lenses of the stereoscope. Many things can be discerned when looking at the surrounding terrain in relief from a bird's-eye view. Under such a set-up, it is possible to inter-

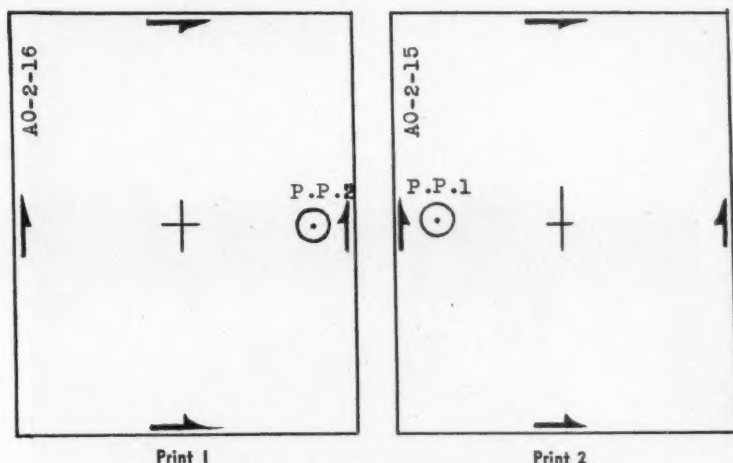


Fig. 4. Transferring principal points on a stereo pair of prints

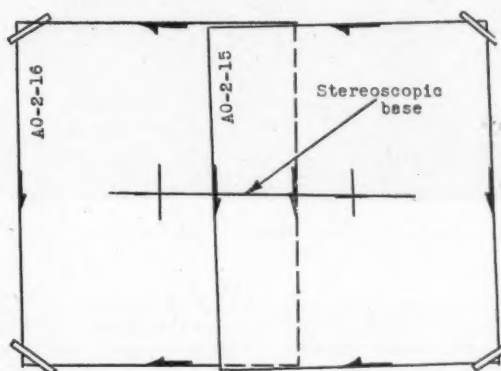


Fig. 5. Final orientation of a stereo pair of prints

pret, camouflage, geological formations, drainage facilities, likely places for habitation, heights of objects, and many other natural and cultural features. Figure 6 is a stereogram showing an interesting geological formation from which a study may be made by the use of a stereoscope.

Photographic interpretation is the science of identifying the visible detail from their images in a photographic print and involves the study of "Tone," "Light and Shadow," "Shape and size."

A large amount of light reflected from an object results in a white object in the print, while no light would result in a black object. In between these two extremes are all the shades of gray. The shade of gray of an object is known as the tone of the image. The less light reflected, the darker the shade of gray or the darker the tone.

The amount of light reflected depends on the texture of the image and the angle of the reflected light. A smooth surface is generally a good reflector and would be white unless the light is reflected away from the camera.

When studying photographs, it is important to place the prints in such a position that you are facing the source of light and the print shadows fall toward the student. This puts the light in the same position as the sun was when the picture was taken. This is very important when studying relief. The two prints below are the same photograph, only one is reversed. Examine them and note the difference in relief.

Many instances have been brought to the writer's attention whereby a precision aerial survey followed by an accurate stereoscopic examination of the prints would have saved thousands of dollars in actual money outlay and many hours tedious labor by a geological field party.

One case in particular where a very fine working hypothesis could be easily built up is shown in Figure 8.

Figure 8 is a reproduction of a single photograph, and a close study of it reveals an enormous amount of information. For instance, notice the two white lines running from the upper left hand corner downward to the right to about the center of the print. With the naked eye, they ap-

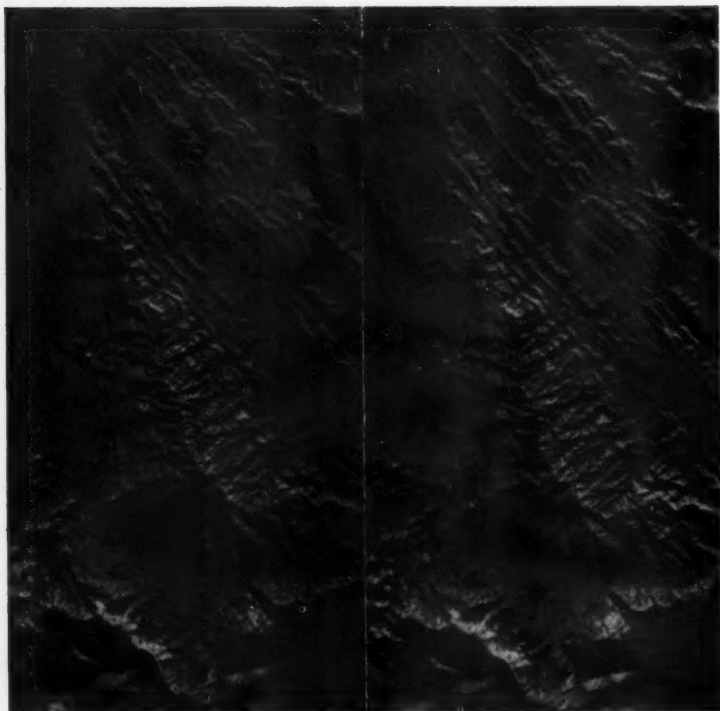


Fig. 6. Stereogram showing strata formations

pear meaningless, but in this case, when studied under a magnifying glass, lend strength to our supposition.

These white lines appear to be definite veins which may have been exposed by open trenching. This appearance is further strengthened by what appears to be several shaft houses at the lower end of the white lines near the center of the print.

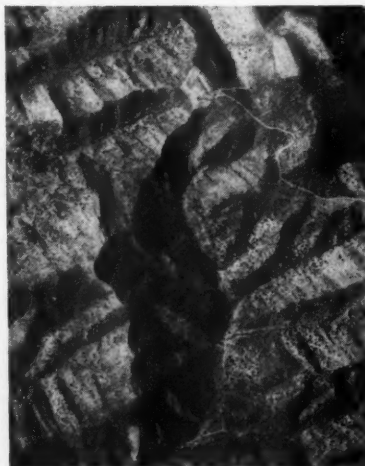
At the middle of the print, there appears what could be interpreted as a contact intrusive or irregular fault running about north and south. This fault probably ends mineralization in the veins. Being badly fractured and providing favorable chemical and physical conditions, large ore shoots may be created close to the contact.

This could account for the shafts being where they are at the sloping contact. Further evidence of large ore bodies is given by the apparent surface cave-in of a large stope and the many little prospect holes staggered along the zone of fracture.

With this information, an inexperienced person could easily locate future prospects close to the vein. It would be very simple to spot locations of 45° drill holes, and by scaling directly from the print, be sure the hole would cross the vein below any possible zone of weathering. This is possible because the veins appear to be vertical or nearly so, there being no decided

change in direction of the vein as it crosses the ridges and valleys.

When a stereoscopic study is made of a stereo pair of prints of this same territory (Figure 9, a spacial model), one is more firmly convinced that what was interpreted from the single photograph is correct. Height can be given to the shaft houses, depth to the surface cave-in and even a third dimension given to the exploration prospects.

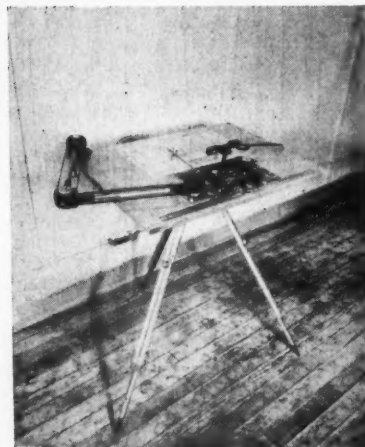


Another typical example of the wealth of information that can be obtained by studying an aerial photograph before actually going into the field is shown in Figure 10.

The braided stream running diagonally across the print is typical of arid land. Just to the right of the stream can be seen a flat iron effect, inclined rock strata, with the point of the flat iron up dip. This indicates an anticline to the right and a syncline to the left.

At the north edge of the print is seen a hair pin fold with a plunging syncline to the west.

The general appearance of the terrain bounding on the stream gives somewhat the appearance of an oil field. The very small white spots have indicated oil derricks on other prints, so it is only natural to suppose they mean the same in this case. The gen-



Abrams Contour Finder with plane table set up for field interpretation



Fig. 7. Reversed photographs showing apparent difference in relief

eral geological pattern suggests an oil field.

It is very important in basing our hypothesis to know if the dip of the strata is uniform or non uniform.

This can be done by using a stereo pair of prints in conjunction with the Abrams contour finder, a parallax measuring device, which, by means of floating dots, can accurately determine the difference in elevation between the top and bottom of any slope.

Enough readings can be taken to prove that the slope is either uniform or irregular. If of uneven slope, we would expect the presence of a terrace.

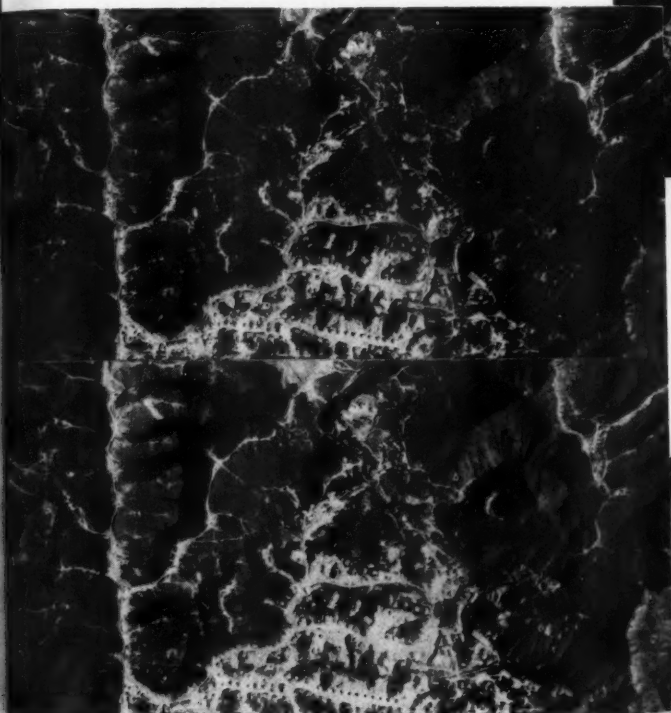
Oil, if any, in this case, usually is found along the flank of a fold or at



Fig. 8. (above) Simple photograph interpretation

Fig. 9. (left) A stereo pair of same territory shown in Fig. 8

Fig. 10. (below) What information can you get from this single photo?



crest of an anticline, although it does occur at a terrace.

If the slope is uniform, the prospector already has three things against him.

1. He is gambling on there being oil present.
2. Is the rock porous or impervious?
3. Is the structure right?

If the slope is non uniform and irregular, there may exist suitable traps.

A geologist, by proper use of prints, stereoscope, and contour finder, could

Fig. 11. (right) A stereo triplet set of prints—scale 1:40000

Fig. 12. (below) A northern Michigan single print—scale 1:20000

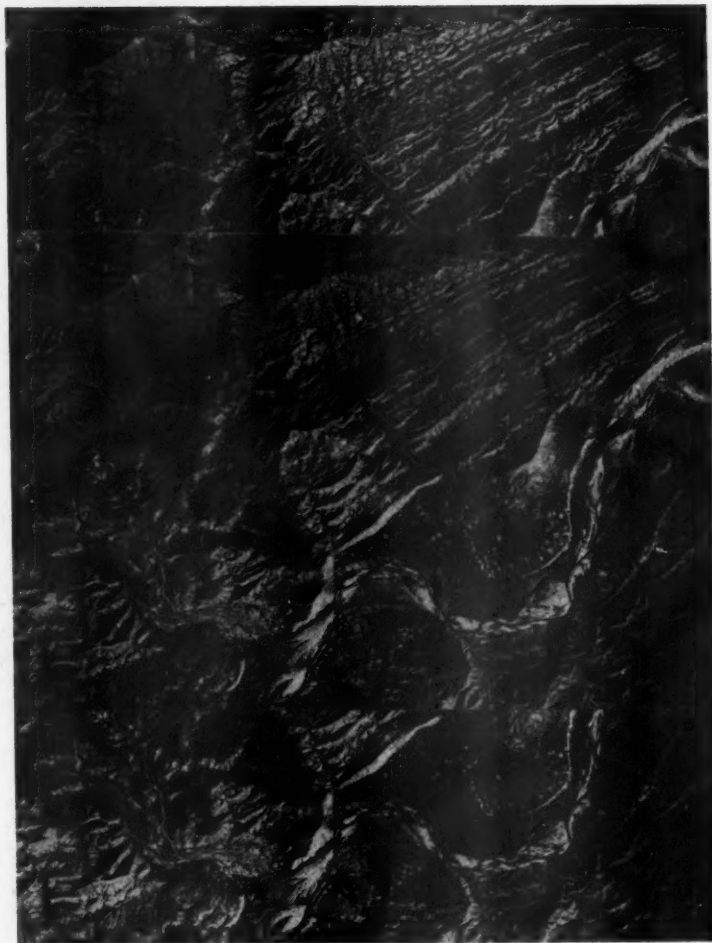
do a large share of his interpretation work right in his own office and use his field party for checking purposes.

A stereo triplet, Figure 11, of this territory, as seen through an Abrams CF-8 stereoscope, will greatly improve our interpretation. A more definite line of thought may be possible concerning the terrain near the river at the bottom of the fold.

The print reproduced in Figure 12 shows a large open area in the upper center of the picture with a river running directly across the print, and another smaller river running to the upper edge of the photograph.

However, when this print is used in conjunction with its adjacent print to form a stereo pair and view through a stereoscope, an entirely different story is obtained.

It will now be seen that the spacial model presented shows a very high angle fault occurring just to the east of the sand plane. It shows a definite zone of fracture and if the country



rock is favorable, it is only right to expect some chemical action to have taken place, with its accompany mineralization. To prove a point, a geological party did prospect the small creeks adjacent to this fault and in nearly all of them got traces of gold.

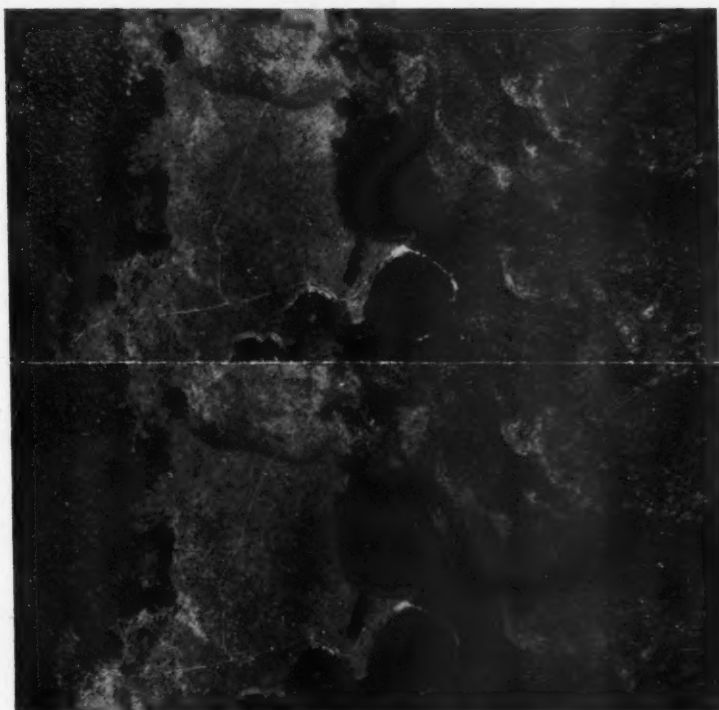
Another way in which aerial views would prove valuable to a geological survey or mining venture would be in the form of a mosaic.

A mosaic is made by carefully pasting the individual prints to a masonite base board and, by means of the overlap necessary in all vertical aerial pictures, carefully match details, tone and color. An excellent map substitute is obtained, which give to the observer a real bird's-eye view of a very large area. Only in this way can an entire mining range be viewed at one time. Each area can be studied in relation to an adjoining area and the entire surface geology correlated without an extensive field survey.

A mosaic can be of two types, controlled or uncontrolled. The uncontrolled type is assembled by matching

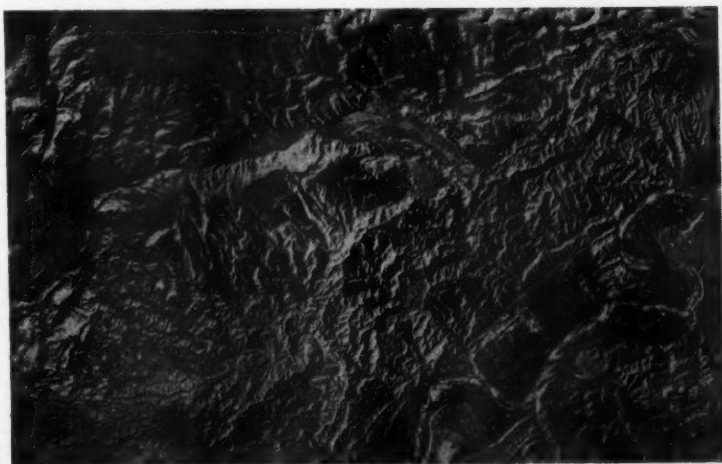
Fig. 13. (right) A stereo pair of same terrain as shown in Fig. 12—scale 1:20000

Fig. 14. (below) Picture of a semi-controlled mosaic—scale 1:100000. This represents an area 13 miles by 16 miles. Provides a geologist with an excellent surface map



detail, tone, and color. Much care must be exercised by the workman in actually laying this type. He may choose to lay one flight line at a time, which may cause a large amount of rework if he allows the distortion in the prints to swing the entire flight to one side or the other.

By careful workmanship an uncontrolled mosaic can be laid up which in



every way can be used as a map substitute. The scale of this map substitute will be the average of the scales of all the prints. The prints will not be rectified, therefore each print scale will be different, but when using the mosaic the scale as computed from the flight height and focal length could be used for estimating.

A controlled mosaic is just what the name implies. The same method of matching detail, color, and tone must be used; however, a rectified or scale adjusted set of prints are now used, in which an effort has been made to eliminate errors due to tip, tilt, and distortion.

JANUARY, 1944

The control consists of survey stations six or seven prints apart whose absolute coordinates are known and which are identifiable on the photographs.

These control points are plotted on a base sheet upon which some type of projection (Polyconic, Lambert, Mercator, etc.), has been laid out.

This network of widely separated control stations is strengthened by picking picture points on overlapping photographs, and using the "Lazy Daisy" mechanical triangulator templates.

By this means a large number of points are obtained on the base sheet,

and by matching similar points on the photographs to their plotted position on the base sheet a mosaic can be laid which in every respect is true to the predetermined scale of the base sheet.

A controlled mosaic, when held to the proper specifications, is as accurate as a map to the same scale, and can therefore be used as one.

Individual areas can be marked out for closer study and similar prints set up as stereo pairs for use in stereoscopic interpretation. Many geologists actually take the stereoscope and prints into the field. They can then learn to recognize formational outcroppings and boundaries in a very short time.

Aerial surveying will play a bigger part in the future development of large mineral regions, because of the immense amount of detail available from the resulting photographs. The time is not far off when most large mining companies will want an aerial mosaic made of their entire property for tax purposes, boundary disputes, damage claims resulting from cave-ins, available timber resources, water rights and many other uses.

These different items are now shown on individual hand-drawn maps. A composite map of them all would be too large for ready comprehension, but an aerial mosaic would show everything on the surface in a bird's-eye view.

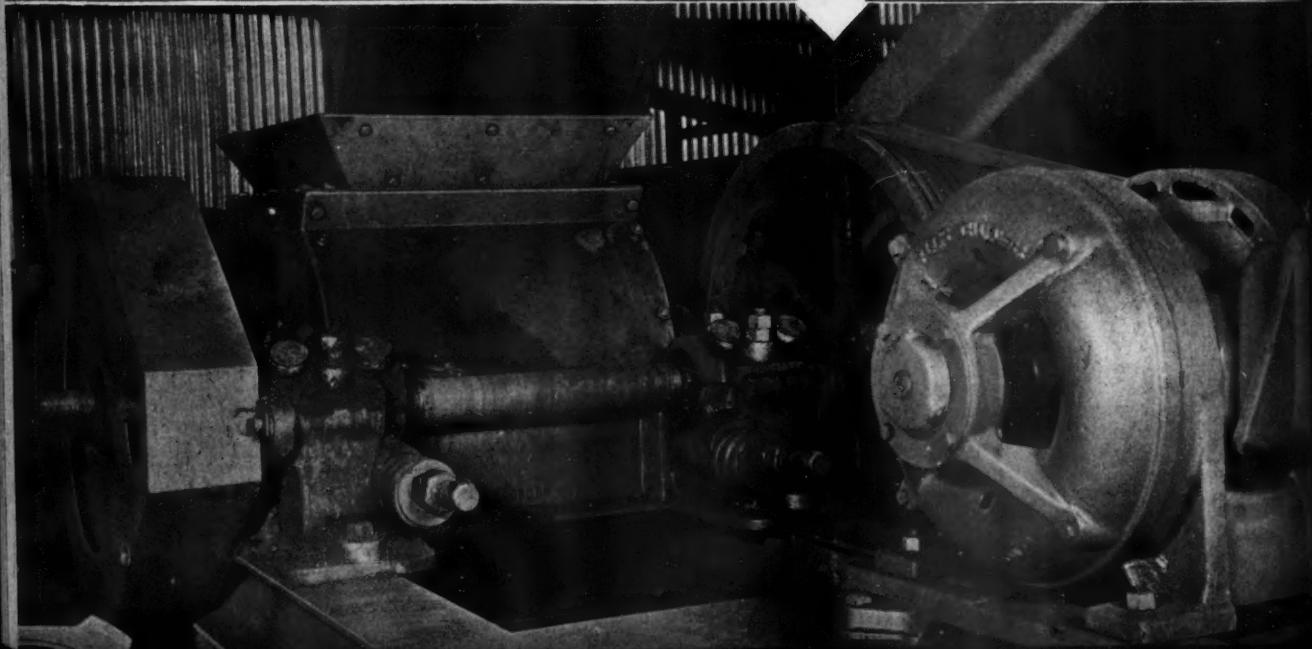
All photographs by courtesy of the Abrams Instrument Company and Abrams Aerial Survey Corporation, Lansing, Mich., U. S. A.

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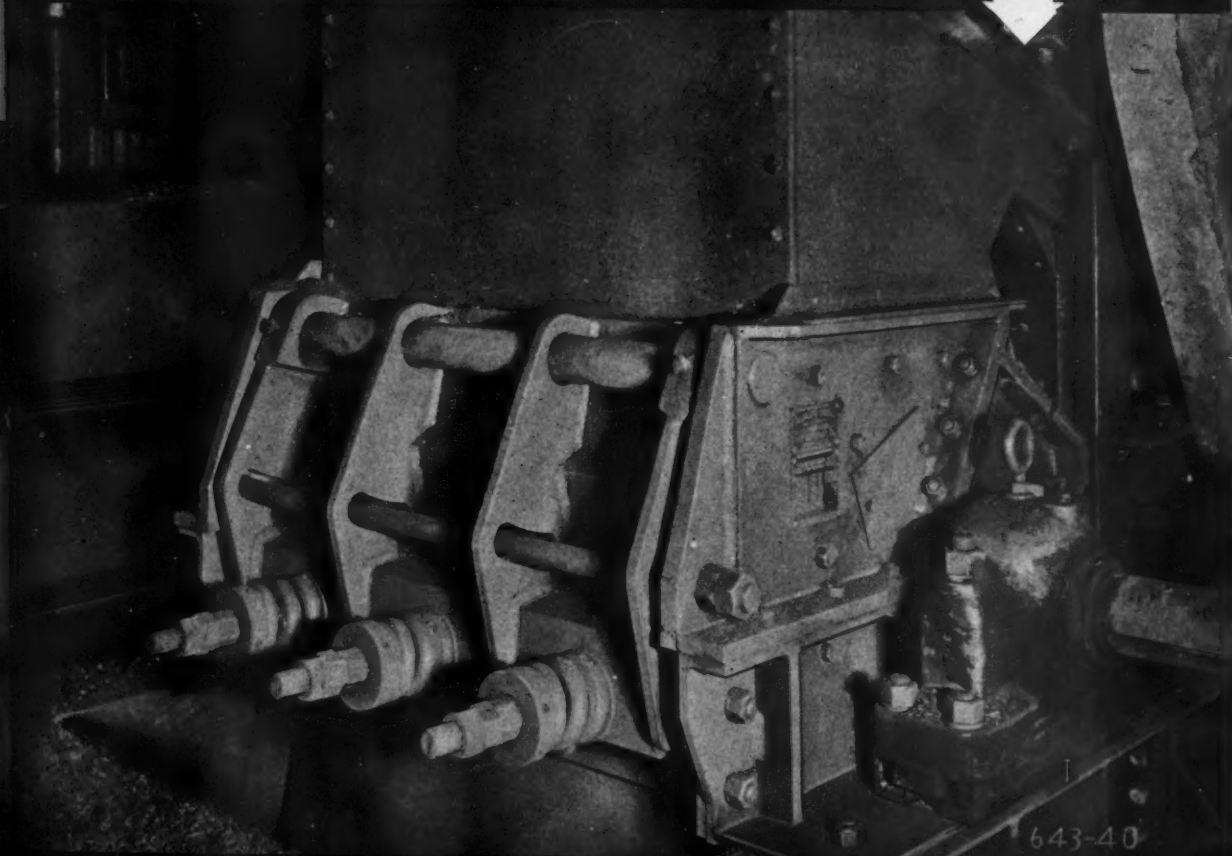
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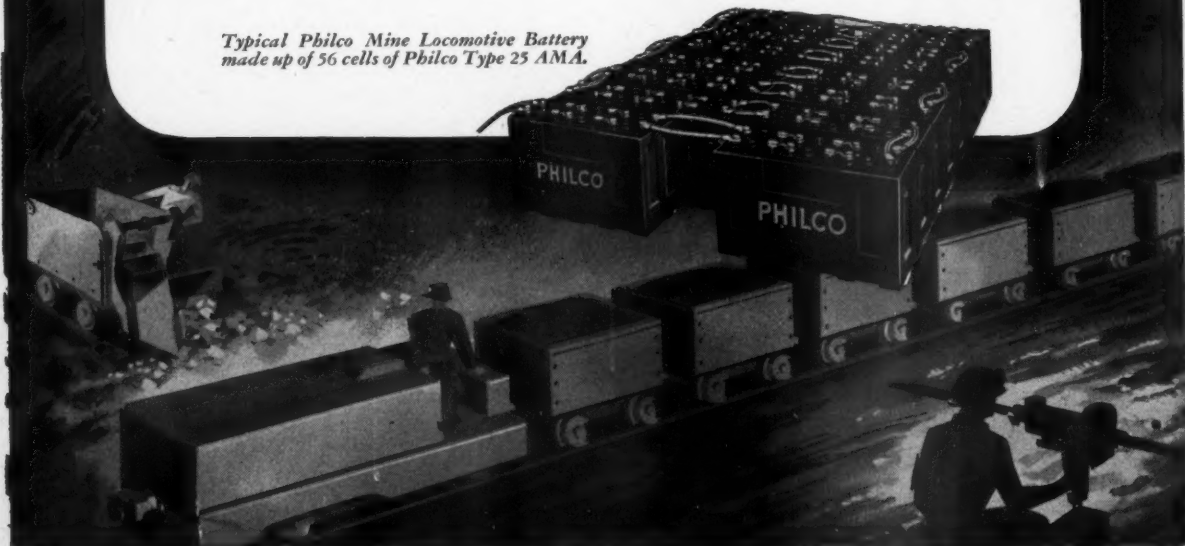
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Fires In Surface Mining and Milling Structures*

Fire is always a serious menace, whether in a residential or in an industrial region; in wartime it is particularly damaging in an industrial plant.

By **D. HARRINGTON**

Chief, Health and Safety Service
Bureau of Mines

and

J. H. EAST, JR.

Senior Mining Engineer
Bureau of Mines

THE mining industry is especially vulnerable, as its plants are generally more or less isolated from centers of population and do not have access to modern fire-fighting equipment; moreover, owing to the transitory nature of most mines, their surface structures are often relatively flimsy and flammable. Trained firemen seldom are available at or near mining plants to teach the fundamentals of fire-fighting to local fire brigades, with the result that efficiency in combating actual fires is lacking. Often the attitude "it can't happen here" is held by the management of a mining property, unless the plant has suffered a serious fire; even then lapse of time is very likely to induce forgetfulness as to the possible hazards.

The necessity for producing metals for the prosecution of this war has increased management's responsibility. Whereas heretofore the loss of a plant or mill by fire meant merely monetary loss to the stockholders of the company, now the national interest is affected, in that the nation suffers from loss of production of minerals indispensable for war purposes.

Fire is a highly effective weapon of the saboteur; hence, not only must the usual fire hazards be guarded against that may cause loss of life or property, but it has also become necessary to prevent the setting of fires by deliberate intent to stop or reduce production.

Occurrence of fires can be reduced to a minimum by simple, sensible methods that have been practiced for years in manufacturing plants in many urban areas as well as in pro-

gressive mining plants, hence cannot be classed as experimental or theoretical. Years of experience testify to their soundness.

The basic principles of prevention of fires or excessive damage from them are good construction, safe operation, adequate protective systems, and organization for emergencies.

Many fires get their start and become destructive for lack of such simple, obvious things as:

1. "Good housekeeping."
2. Fire-resistant storage facilities for flammable materials.
3. "First-aid" fire-fighting equipment.
4. Adequate water supply and distributing system.
5. Well-organized and properly trained employee fire brigade.

6. Fireproof barriers in wooden buildings to localize fires.

7. Precautions during cutting and welding operations.

8. Properly installed electric wiring.

9. Care in the use of highly volatile inflammable liquids, such as gasoline for cleaning purposes.

10. Properly insulated heating stoves.

Good housekeeping includes, in addition to the general definition of the word as used in industry, the disposal of paper; disposal of oily waste and rags in metallic, self-closing containers; removal of accumulated chips, sawdust, and shavings or other readily combustible materials; the sealing of spaces between building floors and ground; and many other things frequently overlooked. The segregation of flammable or combustible materials, and the piling of materials to allow suitable aisle space is all a part of good housekeeping.

Fire-resistant storage facilities for flammable oils, greases, paints, kerosene, and fuel oil are necessary at any mining plant where storage is near other buildings or where loss of the materials would impede production. Such buildings should have concrete or gravel floors, with good ventilation for both roof and floor; they should also be provided with vaporproof electric lighting fixtures. Drip pans under spigots and buried gasoline and fuel-oil storage tanks are all to be considered carefully. Storage facilities that cannot be made safe should



Surface installation near the portal of an underground opening—a good example of what not to do

* Reprinted from Bureau of Mines Information Circular 7250.

be isolated so that fire will not endanger other parts of the plant.

Enough regularly serviced fire extinguishers of a type suited to the work should be placed in strategic places throughout the plant; they should always be readily accessible and plainly marked. Sand, rock dust, or other inert material is of great assistance in handling some types of fires and should be kept handy in boxes.

Seldom is an adequate water supply found at mining plants, and often the distributing system is poorly laid out. Fire hydrants should be placed at such a distance from a building that a fire would not prevent their use. A standard fire stream is generally recognized as 250 gal. per minute with a 1½-in. nozzle and a pressure of 45 lb. at the nozzle, and at least two fire streams should be available in an emergency. The friction loss of water flowing in pipes is higher than is generally realized; with a flow of 500 gal. per minute, the friction loss per 1,000 ft. in a 6-in. pipe is 15 lb. per square inch, and in 4-in. pipe it is 100 lb.† Connecting fire mains to form a loop to eliminate dead ends is always recommended.

To be efficient, employe fire brigades must receive training at regular intervals. All members should be trained in the operation of all types of fire-fighting equipment on the property; they should be instructed how to operate fire pumps if the plant is equipped with pumps; the location and operation of water valves should be made known to them; and they should know how and where to cut off the electric power. They should be instructed as to the type of fire-fighting equipment best suited for use in various types of fires.

Many mining plants have groups of wooden buildings connected with wooden snowsheds. Fireproof or fire-resistant barriers should be part of the construction to localize a fire. Large mill buildings should have some fireproof partitions to prevent rapid spreading of a fire and to give the fire brigade additional time to extinguish the blaze.

Cutting and welding with oxyacetylene torches is a prolific cause of fires, both on the surface and underground. The place of work should be thoroughly wet down before the torch is used and again after the work has been completed. A fire extinguisher should be part of any portable welding outfit. Good practice requires a second fire inspection at least one hour after welding or cutting has ceased; this is becoming one of the most essential features in prevention of fires in and around mining plants.

Electric wiring should be done in

† National Board of Fire Underwriters Fire Stream Tables.

After the fire . . .
wrecked shaft,
bins and
shops



accordance with the requirements of National Electrical Code. Wiring that will not meet the requirements of the code should be inspected frequently and carefully, as poor electrical wiring is another common cause of fires.

The use of high flash point or non-inflammable liquids for cleaning machinery should be required; gasoline has caused so many fires as well as accidents that its use for this purpose should be prohibited. Virtually all major oil companies manufacture a petroleum product suitable for this purpose classed as Stoddard Solvents and sold under a variety of trade names. These have solvent properties approximating gasoline, but with fire-hazard properties similar to kerosene. Trisodium phosphate also is recommended for cleaning.

Heating stoves should not be installed near wooden walls without suitable insulation nor placed directly on wood floors without an incombustible lining such as hollow tile, steel

plate covered with asbestos sheet lining, or a sand tray. Roof fires in surface buildings caused by overheated stove pipes and poorly constructed chimneys are reported frequently.

Much has been written about fire prevention, and definite standards have been set by the National Fire Protection Association, which, with some modifications, will cover almost any mining installation. These standards can be obtained from the association or from many public libraries. The National Park Service, Department of the Interior, has issued a publication entitled "Prevention and Control of Fire Losses," which contains much information on fire prevention.

SOME EXAMPLES OF RECENT FIRES IN MINING PLANTS

West Virginia Mine

Fire destroyed the power plant at a West Virginia coal mine in May, 1943, with an estimated loss of \$25,000. The mine will be idle until the power plant is rebuilt—possibly 6 months, as priorities for needed materials are difficult to obtain. The mine employs 190 men, and the average daily production is 750 tons; hence, this fire may cause loss of production of upwards of 100,000 tons of coal at a time when coal is sorely needed.

The sides and roof of the power-plant building were of wood-frame construction covered with corrugated sheet metal. The floor was of tongue-and-groove lumber. One 3-gal. foamite

fire extinguisher was in the building, and running water was nearby, but fire buckets had not been provided.

Two bbls. of oil, 1 bbl. of grease, 1 bbl. of kerosene, and 4 gal. of gasoline were stored in the building. The floor of the building was soaked with oil from leakage from three Diesel engines. Mechanics were cleaning and inspecting equipment and were using gasoline from a 2-gal. can for cleaning purposes. The power plant was on a hillside, and the space between ground and floor was used for storage. The ground beneath the floor was fairly well soaked with oil, and oily waste had been thrown there.

The cause of the fire is not known, but it probably started at the gasoline container used by the mechanics. One

of the men removed the container from the building while the other smothered the flames with seat covers from an automobile. Fire was discovered burning under the floor, and the men attempted to extinguish it with the fire extinguisher and with water, but the fire was beyond control. Although the mechanics stated they had not been smoking, smoking is suspected as the probable ignition agency.

Oklahoma Mill

Fire was discovered in an Oklahoma zinc ore-concentrating mill in March, 1943, by a company official who was passing the plant. A night watchman coming on shift reached the plant at the same time. The fire department was called and responded in a few minutes, but the fire had made such headway that only adjacent buildings were saved. All machinery in the mill building was either damaged or destroyed by the fire. Neither the watchman nor the company official knew how to start the fire pump, and part of the company-owned fire hose was found to contain ice, which caused the hose to rupture when the water was turned into it.

Repair crews finished work at 3.30 p. m. (Sunday), but no one had been in the end of the mill where the fire started later than 3 p. m. Numerous wooden catwalks are in this section, and many were covered with grease and oil. The repairmen had been using acetylene torches during the day, and smoking had been permitted. The electric power had not been cut off the mill building when the repair crew left the mill. Electric switches were on wooden panel boards, and motors were on wooden platforms. Some of the wires were not in conduit.

The cause of the fire has not been determined. Destruction of the mill is a serious blow to the production of zinc at a time when zinc is needed for war purposes.

Colorado Mine

A fire broke out in the blacksmith shop of a Colorado mine in January, 1942, and spread to adjacent buildings, all at the portal of the main haulage tunnel. Smoke from the fire filled the mine, and eight miners were suffocated.

Log cribbing 10 to 15 ft. high was built around the tunnel portal to support the sides of a steep cut. The compressor house and blacksmith shop were built into this cribbing, one at the right of the tunnel portal and the other at the left; both were of wood construction connected by a wood-roofed snow shed over the portal and extending about 100 ft. to the ore chute dump.

The compressor building housed two compressors, machine lathe, work

bench, and a small transformer. At the time of the fire, 50-gal. drums of compressor oil, cylinder oil, and cutting oil were stored in the building as well as a supply of oxygen and acetylene gas. The blacksmith shop housed a low-pressure oil forge, two compressed-air-operated drill sharpeners, an electric grinder, and a blacksmith forge. The 110-volt electric wiring was on insulators but not in conduit. A 10-gal. drum of distillate fuel for the oil forge was on the roof of the shop so that the oil might be fed by gravity to the forge through a $\frac{1}{2}$ -in. pipe line fitted with a shut-off valve, which supplemented the regular feeder valves. An open coal bin was on the west side of the blacksmith shop, and nearby were two 50-gal. drums of distillate. Both coal and oil were near the tunnel portal. An old wood mill building was about 50 ft. in front of the portal and was used only as a stable and timber shed. Several bales of hay were piled outside the part used as a stable. A two-story boarding house was 140 ft. from the mine portal. This building was menaced by

these buildings were burned. The fire was fought ineffectively by shoveling snow on it and by using the few available fire extinguishers.

The cause of the fire was undetermined. It may have been caused by a short circuit in the electrical wiring or a leak in the oil-force supply line through which oil was sprayed on to the hot forge.

Oklahoma Zinc Mill

A fire was discovered by the night watchman in an Oklahoma zinc mill about 5 a. m. in February, 1943. The structure comprised the shaft house, ore bins, crushing plant, concentration plant, compressor room, and store-room. The mill operated from 8 a. m. until midnight and had a rated capacity of 750 to 1,000 tons of ore in 24 hours.

The night watchman made regular trips through the mill punching the key stations hourly. His duties included keeping fires in a number of coal stoves throughout the plant. The watchman stated he had placed coal in a number of stoves and laid the



An excellent example of a fan installation

the fire but was not burned. Fire-fighting equipment consisted of a few 1-qt. carbon tetrachloride-type fire extinguishers distributed in the various buildings.

The general superintendent came out of the mine at about 11.25 a. m., and went to the boarding house. The blacksmith shut off the oil forge at the same time and instructed his helper to watch it, then he also went to the boarding house. The fire alarm was given before he started to eat.

Two other men started to eat lunch in the compressor house, when they noticed smoke and immediately stopped the compressor. They attempted to enter the blacksmith shop but were stopped by the flames. The fire spread rapidly to the compressor house and mill but stopped when

clock down near an electric switch while he went upstairs to cover a motor on account of a rain. While he was upstairs he heard a loud noise below and ran down to investigate. He saw the electric switch and surrounding area in flames. He roused the mill master mechanic, who lived about 100 yds. away, and called the fire department, which responded in 5 or 6 minutes. Several barrels of oil and flotation reagents were stored in the mill about 10 ft. from the place where the fire started.

The master mechanic stated trouble had been experienced with the electric switch responsible for the fire, which had caused the wooden terminal supports to burn. The "smoking and sputtering" at the switch had given warning of trouble, and the wooden

terminal supports were replaced. The switch box held about 10 gal. of transformer oil.

The chief of the fire department stated he arrived at the mill within 6 minutes after receiving the fire alarm, and that the whole mill structure was in flames. He stated many explosions occurred in the burning building after his arrival. The transformer building and other surrounding structures were all that could be saved.

The proprietor of an electrical company that had done much of the electrical work at the mill confirmed the statement of the master mechanic that the wooden terminal supports had been changed several times because the wood had been burned, and stated an unsuccessful attempt had been made to obtain a porcelain-insulated support. He said the main switch in the transformer house should have been pulled when the mill was not in operation, but that he did not believe the switch would have "exploded without warning," as stated by the watchman, and was of the opinion that the progress of the fire indicated it might have been burning for some time before the watchman saw it.

The fire probably was started by an electric arc in the starting compensator (called electric switch above); combustible fuel was present at the starting point, which contributed to the rapid progress of the fire. Failure to pull the main switch at the transformers when the mill was closed down probably was the direct cause of the fire. Failure to pull the switch when only one watchman was on duty and a switch known to be defective contributed to the rapid progress the fire was able to make when once started.

South Dakota Mine

Fire was discovered in the concentrate dryer room in a South Dakota mill at about 11 a. m. in January, 1943. The mill and Diesel plants were housed in the same building, which was constructed of wood and covered with galvanized-iron sheeting. The concentrate dryer was a 5 by 40-ft. indirect-heating rotary type. The compressed-air oil burner was placed outside the combustion chamber, so that the flame entered the chamber and supplied heat to the closed dryer pipe.

The general superintendent stated that the burner flared frequently and had to be cleaned often. The burner was specified to work efficiently with 15 degree gravity heavy black oil, but owing to difficulties in obtaining this grade a mixture of lighter fuels was used, which gave an oil with a relatively low flash point.

The general superintendent stated



Carpenter shop. Efficient guards and good housekeeping promote safety and materially reduce fire hazard

he was in the mill and the oil burner was working normally a few minutes before the fire. He had gone to the Diesel engine room when he was notified of the fire. A fire hose was connected immediately, but the fire had gained such headway that fire fighting was ineffective. The mill and Diesel plants and equipment were burned completely in less than one hour.

The burner was situated 6 ft. below a wooden floor, 5 ft. from one wooden wall, 9 ft. from another wooden wall, and 5 ft. from a concrete wall. The floor was concrete. The burner is believed to have clogged and flared as it had in the past and to have ignited the surrounding woodwork.

This is an example of apparent failure to correct a fire hazard known to exist. The mill product was a war essential and its loss is a serious blow.

New Jersey Mine

Fire was discovered by the foreman in a New Jersey iron-ore mill about 5.10 p. m. in June, 1943. The foreman smelled smoke while he was on the top floor starting the flow of damp ore to the dryer. He ran to the lower floor and saw a wooden chute burning beneath a screen that receives the hot ore as it passes from the dryer. Two men on the top floor were called to help extinguish the blaze with carbon tetrachloride-type fire extinguishers but they were unsuccessful. After about 10 minutes the men opened the water valve on the "dry pipe sprinkler system" and, with four other men, obtained a fire hose from a shed near the plant road. One man turned in the fire alarm, and fire departments from several nearby towns responded; but the fire had made such headway that the roof collapsed, breaking the sprinkler pipes, which caused a drop in water pressure. The building was of wood

construction and burned rapidly, nearly the entire upper part of the mill structure being consumed.

The cause of the fire is unknown. The most logical explanation is that some of the hot ore discharged from the dryer after passing through the receiving screen lodged on the wooden chute below, setting fire to it. The ore feed was unusually damp that day, requiring that the dryer be operated at full capacity to dry the ore satisfactorily.

The use of wood in the construction of chutes or bins in handling or storing of hot materials is anything but good practice; fireproof materials should have been used.

The need of training for employee fire brigades is demonstrated. The employees should have called the fire department when the fire was first discovered and should have applied water to the fire. Properly installed sprinkler systems are usually more effective in fire fighting than chemical fire extinguishers, though in this instance the sprinkler system evidently was not effective.

It is more important now than ever before in the history of mining in the United States to prevent loss of essential materials and plants, not only because they are essential but also because of the difficulty of replacing them.

Fire hazards usually can be eliminated at small expenditure of labor and money as compared with the amount of loss likely to result from a fire. Careful survey by a competent fire-prevention engineer of conditions and practices at each plant and correction of those not standard will reduce most fire hazards. Fires in surface plants producing minerals essential to the prosecution of the war constitute definite sabotage at this time, whether the fire is caused maliciously or through carelessness. *Beware of Fires in Mineral Plants.*

The Decay Resistance of Oak Wood

INTELLIGENT SELECTION of wood for the job it is to do is particularly essential during wartime conditions of scarcity when supplies must be conserved and useful life extended. One way of increasing the service life of wood exposed to damp conditions is to select material that has a high natural resistance to decay. Another way, of course, is to impregnate the wood with suitable preservatives, but this report is not concerned with that phase of the subject.

The information summarized in this report is intended as an aid in the selection of oak wood for service under different conditions of decay hazard. The decay resistance of the heartwood of representative species of white oak was compared with several kinds of red oaks. In addition, resistance as governed by the locale of the tree's growth, position of the wood in the individual tree, and the presence of sapwood was investigated.

In pursuing this study, laboratory decay tests were made of wood from 375 oak trees of 7 different species grown in all major oak-producing regions near or east of the Mississippi River and one region on the Pacific Coast. The test trees were cut in widely separated localities in each region, and usually no less than six trees of each species were sampled in a locality.[†]

All of the test trees were essentially of the same size, the diameter at breast height ranging from about 15 to 18 in. From each tree six increment cores were taken, two of which were inoculated with each of three fungi known to occur on oak.

The species tested were chestnut oak, Oregon white oak, white oak, and swamp chestnut oak, which as a group passed commercially as white oak, northern red oak, scarlet oak, and black oak in the red-oak group.[‡] Unless sapwood is specifically indicated, all comparisons of decay resistance in the following sections relate to heartwood only.

Differences in Decay Resistance Between Different Species of Oak

Measured by the amounts of wood destroyed (weight losses) by the test

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[†] A locality refers to an area of a comparatively few acres in which the respective test collections were made.

[‡] Also sometimes referred to as the black oak group.

At this time when every effort is being directed toward conserving labor and material underground, Mr. Scheffer's comparisons between the expected service life of various kinds of oak wood will be of special interest to the mining industry.

By THEODORE C. SCHEFFER*

fungi, the heartwood of the four white oaks tested was on the average considerably more resistant to decay than that of the red oaks. This result is in line with what is commonly reported about the durability of wood from these two oak groups. Since even the white oaks do not rank with the most durable woods, such as black locust, western redcedar, and redwood, the red oaks, unless impregnated with a wood preservative, obviously should not be used in places where a substantial degree of decay resistance is needed.

The average relative decay resistance found for the individual oak species is summarized graphically in Figure 1, in which greater weight loss indicates lower decay resistance. In interpreting Figure 1, it must not be supposed that the life of the different species in service will vary exactly with the weight losses here recorded. The latter give the best available indication of the relative susceptibility of the species to decay, but only field tests lasting through many years can be used as a basis for predicting actual service life.

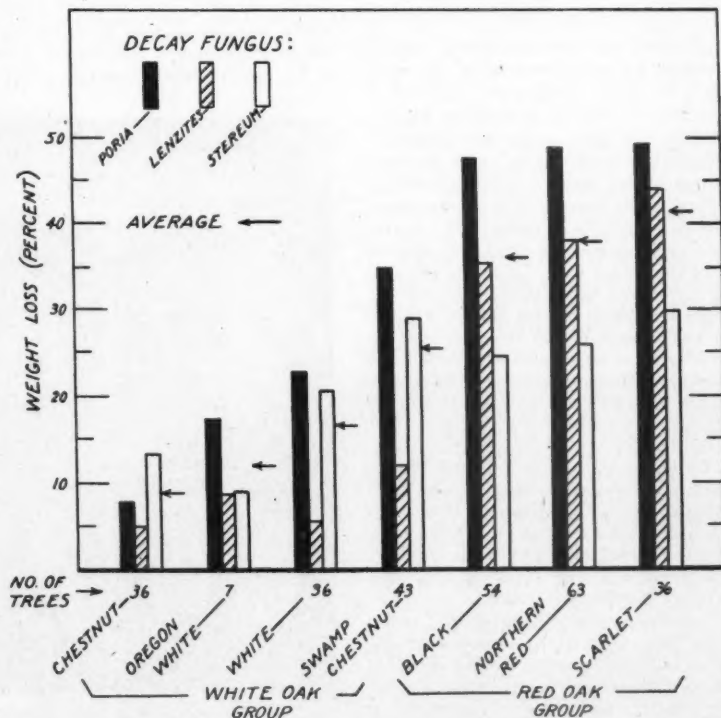


Fig. 1. Average weight loss caused by decay in cores from trees of different oak species

The species of the red-oak group differed little among themselves in the amount of decay resistance shown. Those in the white-oak group, on the other hand, differed considerably in this respect. For example, the swamp chestnut oak was destroyed at a rate almost three times as fast as was chestnut oak, and about one and one-half times as fast as was white oak. One of the points of chief practical significance brought out by this study lies in the fact that, contrary to a common supposition, the different white oaks do not have uniformly high decay resistance. Consequently, the outdoors service life of the various white oaks should not be expected to be the same.

The consistently high resistance shown by the Oregon white oak wood makes it fairly probable that this species is at least as durable as white oak. Whether it is actually more durable on the whole, as suggested by the tests, is uncertain because of the smaller number of trees sampled.

No clear difference was found between the decay resistance of wood from white-oak trees and wood from trees of the same species sometimes referred to as "yellow-bark oak." Likewise, no difference was found between wood from northern red-oak trees and from trees of the same species sometimes called "gray oak."

Overlapping of Decay Resistance Between Different Species of Oak

Besides the average decay resistance of a particular species, its variation in decay resistance as between individual trees is sometimes helpful in deciding whether the species merits particular preference over another. Three of the species in the white-oak group were compared with northern red oak for this purpose. The variation in decay resistance of each species was compared with northern red oak to ascertain what proportion of the trees had more or less than the average resistance of the red oak; that is, to determine how much overlapping of decay resistance existed. Obviously, the more overlapping, the smaller the chance of getting more durable wood from one species than the other.

Only about 80 percent of the swamp chestnut oak trees had wood with greater decay resistance than the average northern red oak. But the wood of all the chestnut oak and white oak trees was more resistant than the average northern red oak.

The same data indicate that if wood with decay resistance superior to the most durable northern red oak is wanted, the chances of getting it may be about three times as great with chestnut oak as with swamp chestnut oak, and about one and one-half times



Broken timber resulting from decay during one year in a coal mine

as great with white oak as with swamp chestnut oak; providing, of course, that the same number of trees are taken in each case.

Because of this variation in the decay resistance of trees of the same species, coupled with a variation within the individual trees themselves (as will be brought out further on), some wood of even the most resistant oak species will be found only moderately resistant. The significant thing is that, by and large, chestnut oak or white oak wood can be expected to last enough longer than wood of any of the species of the red-oak group to

make its use preferable where decay conditions are severe.

Decay Resistance of Oak Wood from Different Regions and Localities

It is sometimes said that white-oak wood from one state or region is much superior in decay resistance to that from another. The present tests did not bear out this contention, either as regards white oak or any of the other species tested. Fairly strong evidence was obtained, however, that within a given region oak from some localities is more resistant than that from others. Localities with white oak of particularly high resistance were found in each of the principal regions. The samples of this species from the seven localities in the Central States and Upper Mississippi River Valley averaged slightly more resistant than did those from other parts of the country, and the samples from the four localities sampled in the Northeastern States averaged lower. The differences were not large enough or consistent enough, however, to suggest that differences between states or regions as a whole are of importance.

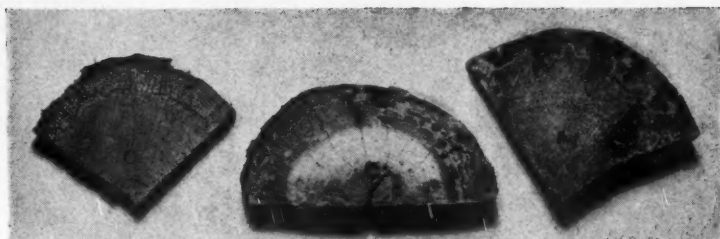
Differences in average decay resistance between one locality and another were not related to the growth rate of the trees or to the elevation at which the trees were grown. Consequently, no way can yet be suggested for predicting without actual testing whether the decay resistance of wood from a particular locality is above or below average for the species.

Decay Resistance of Oak Heartwood in Different Parts of the Same Tree

The heartwood from different parts of trees of northern red oak, white oak, chestnut oak, and swamp chestnut



Round post and split lagging heavily decayed after two years in a copper mine



Freshly cut cross sections of oak, cherry, and maple props, showing decay that occurred during 18 months in a coal mine. Only the oak prop is still serviceable, but the sapwood shows signs of considerable decay and probably has but little of its original strength

oak was also tested for decay resistance. In each case, but especially with the three white-oak species, the most resistant wood was found to occur in the upper part of the trunk. Next in resistance was the outer heartwood in the lower part of the trunk, and least resistant was the central heartwood in the lower portion of the trunk.

Such differences, as already pointed out, cannot be interpreted directly in terms of differences in the expected service life of wood from different parts of individual trees. Nevertheless, they were substantial and plainly indicate that the service life may be determined in no small measure by the part of the tree from which the wood is taken. For example, the central heartwood in the white oak decayed about twice as rapidly as the outer heartwood. Boxed hearts from large trees of species of the white-oak group appear unsuited to conditions

of high decay hazard unless they are from a species with a particularly high over-all level of decay resistance, such as chestnut oak. Conversely, sawed timbers from the outer heartwood of large chestnut or white oaks should prove particularly durable.

The general part of the tree diameter from which a board or timber was obtained often can be roughly ascertained by the curvature of the growth ring. Thus, wood with growth rings with short radii is likely to be from the inner, less resistant portion of the heartwood. The opposite holds if the growth rings have little curvature.

Decay Resistance of Oak Sapwood

A small number of tests was made on the sapwood of four of the species. The sapwood of white oak decayed less than that of chestnut, swamp chestnut, or northern red oak. Even

the white-oak sapwood, however, decayed too rapidly to be rated as durable. Sapwood should be particularly avoided where resistance to decay is needed.

Conclusions

Heartwood of the species in the red-oak group tested has, as is commonly believed, uniformly low decay resistance.

Heartwood of the species of the white-oak group tested has, in general, moderately high decay resistance. But differences among the white-oak species themselves are substantial enough to warrant some selection for service conditions of particularly high decay hazard.

Heartwood from the upper logs is somewhat more resistant than that from the lower logs, and the outer heartwood is markedly more resistant than the inner. Boxed hearts from large trees even in the white-oak group, therefore, are likely not to be especially durable unless they are of a species having particularly high average resistance.

The average decay resistance of white-oak wood from different localities and from different trees may differ considerably. Contrary to a common belief, however, there probably are no important differences in the average resistance of white oak from different regions or states as a whole.

The sapwood of all oak species should be avoided where decay resistance is needed.

Mobile Compressor Furnishes Power for America's Coal Mines

SOLIDLY built, compact, and mounted on flanged wheels for rail tracks, these powerful, specially built air compressors are examples of fine designing and engineering.

The mine-car compressor illustrated has four compressor cylinders, three of them for low pressure and one for high pressure. A 30-hp. explosion-proof electric motor furnishes the power for generating air pressure up to 100 lb.

The entire compressor plant is air cooled, thus eliminating the need for water tanks and extra weight. Intercooling is by circulating fan. The air receiver, 18 in. by 48 in., is mounted on a welded steel chassis which is provided with adequate bumpers and end couplings.

The compressor intake has double air filters of large capacity. A pneumatic unloader maintains constant pressure in the receiver, even if compressor is running at constant speed.

(Data and photo courtesy Compressed Air Institute.)

Lubrication is a "constant level" system, providing adequate lubrication to all parts regardless of the angle of the track. Crankcase is sealed against dust and dirt. The entire compressor plant incorporates every known safety factor.

Wherever air is needed underground,



Special built two-stage air compressor plant for bituminous coal mines

either for mining or tunneling, the flexibility in design and construction of compressors readily accommodates for low headroom. According to the Compressed Air Institute, this adopting of compressed air to special needs is one of the positive advantages which is influencing a growing acceptance for air powered tools in many new applications.



Coal Division Reports

The Committees Report to the Annual Conference

A resume of the studies that are being made on important phases of mining.

By G. B. SOUTHWARD

Mechanization Engineer
American Mining Congress

COMMITTEE ON POWER

C. C. BALLARD, *Chairman*

THE DEVELOPMENT of mechanical mining is only possible through a corresponding development in underground power and this committee is keeping up with the modern trend by presenting to the industry reports on various phases of electric power use and distribution.

Color Code for Distribution Power Cables. Under the chairmanship of D. J. Baker, a subcommittee prepared a recommended standard color code marking for polarity, identification of power cables for mining service which was published in the September MINING CONGRESS JOURNAL. Reprints were sent to a number of associations, manufacturers and operators with request for comment or criticism; the replies were preponderantly in approval of these color standards but as a result of suggestions received, some minor changes in the wording of the code as published were made by the Power Committee as follows:

For d.c. cables, the term "positive" is to read *ungrounded or live conductors*; the term "negative" is to read *grounded or return conductors*, and the note "the negative conductor shall always be considered the grounded conductor" is to be *eliminated*. For both d.c. and a.c. cables the safety ground is to be described as *green or uninsulated*, which means that bare wire can be used when desirable.

The code as now recommended by the committee is shown on page 51 of this issue.

A formal approval of the color code was requested by the Power Committee, as its adoption by manufac-

turers of mining equipment would be a means to create greater safety in the use of electric power underground. After some discussion, the Conference unanimously voted that the code as submitted by the Committee be accepted. Mr. Baker further explained that the report had already received tentative approval of N. E. M. A., U. S. Bureau of Mines, Insulated Cable Engineers Association, and that formal approval by these organizations was expected.

Another project now under consideration is to prepare a color code for external connections of motors and motor controls, but quite a little research will be necessary to conform to practices now used by different manufacturers and other organizations.

Synthetic Cable Insulation.—R. A. Grey, Subcommittee Chairman, advised that a written report prepared by E. W. Davis in collaboration with Dr. E. G. Sturdivant and J. H. Simpson had been accepted by the Committee. This report gives directions for repairing and splicing single and multiple conductor cables with various types of synthetics jackets and insulation. Mr. Davis explained that as the use of synthetics was new in mining service, the report had a background of rather limited experience but that later developments may bring out other splicing materials and technique. However, in general, vulcanizing practices are about the same as with natural rubber except that about 10 to 15 percent longer time was needed. J. H. Simpson stated that a number of experiments with various tapes and compounds had already been made and others were now in process; results so far were fairly satisfactory and as time goes on better methods and materials would be developed.

A.C. Power Underground.—This study originally had been set up for two subcommittees—high voltage and low voltage—but it was announced that these two committees had now been combined under the joint chairmanship of D. E. Renshaw and O. G. Stewart. Mr. Renshaw explained that their report would cover incoming line substations with protective features for overload, low voltage, physical failure and lightning. Another study will cover transformer substations both indoor and underground types; also the installation of bore hole cables and underground cables. In addition, tables and curves will be prepared for easy use by the mine electrician relative to voltage drop, size of conductor, power factor, etc. Some preliminary data on these several projects has been compiled and a report will be ready for publication in the near future.

COMMITTEE ON HAULAGE ROADS

R. V. CLAY, *Chairman*

DURING the past year, the Committee completed and published a report on Construction Costs for Service Haulage Tracks, based on three typical mining systems with mechanical loading. Each of these systems was figured for three different types of track construction, ranging from stock sizes to complete fabricated material and tables were presented, giving track costs for a complete panel, including all material used, with proper credit for re-use, and all labor employed for the track installation and removal. These figures showed that the higher cost of the fabricated material was more than offset by the saving in mine labor.

Revision of Turnout Standards.—Standards for frogs, switches and turnouts as prepared by this Committee some years ago, and accepted by the American Standards Association, were subsequently published in book form by the American Mining Congress. These standards have been in use for some time by all the leading manufacturers of track equipment but C. C. Hagenbuch explained that a revision is advisable to meet the modern requirements of track-mounted cut-

ting and loading machines as well as high-speed operation on main line haulages. He mentioned that, among other things, cast frogs might possibly be re-designed so as to eliminate the interference of the flanges on wheels of mining and loading machines; although it may be that some revision is needed in the design of such wheels so that they can run without difficulty over frogs and switches that must primarily be built for locomotive and mine car operation.

J. B. Haskell explained that switches and turnouts now had to meet entirely different service than when these standards were prepared. Longer switch points will be considered as a means to permit higher speed operation with less wear and less possibility of derailment. Attention will also be given to gauge widening on curves with special reference to the guard rail spacing. This study is now underway and it is the general purpose of the Committee to revise the turnout tables so that the new designs will satisfy the track requirements in a modern mechanized mine.

COMMITTEE ON ROOF ACTION

FRANK G. SMITH, *Chairman*

A STUDY on methods to prevent roof falls has been underway by this Committee to determine whether or not chemical-physical examinations of mine roof rock can be used to indicate some method of treatment that will stop deterioration.

Mine Roof Ceiling.—F. G. Smith described a study that had been made by the Committee of a mine roof sealing application which had followed tests of this nature. Some months after the seal coat had been applied, an inspection disclosed that the installation had had some failures and the Committee is now making an investigation to discover why the failures occurred. Written accounts have been submitted by the members giving their individual observations and conclusions; these accounts are now under review and are to be compiled into a committee report.

H. P. Greenwald described a series of laboratory tests which he made on samples of the roof strata to develop the structural strength of the rock and determine whether or not this factor was to any degree responsible for roof failures. His tests brought out the fact that the slate contained numerous bedding planes and under stress, weakness developed along these plane lines. This laboratory data will be included in the published report. A. J. W. Headlee, stated that rolls or flexures in the strata may have been a contributory cause to the roof failure, as several such rolls had been observed in area where the roof was treated. He will make a geological

study of this section of the mine, mapping the location of the disturbed areas and will submit a report on the effect that these irregularities have had on the roof action.

Summing up, the Committee is thoroughly investigating every possible factor that may have a bearing on this problem, in the hope that in time, recommendations can be made on practices or treatment to prevent slate falls that are now so costly in mine operation.

COMMITTEE ON MECHANICAL LOADING

S. M. CASSIDY, *Chairman*

A REPORT on supervision for mechanical loading has been completed and published, which showed several typical organization charts and outlined the supervisory set-up and the duties of the various departments and department heads. E. H. Johnson described how this report was compiled from written discussions submitted by a number of men on the Committee, and these individual accounts represented the experiences of companies operating mechanical loading in a number of states. While many differences in the organizational set-ups were disclosed, it seemed to be pretty thoroughly agreed that the best management is obtained by direct line authority and not by functional organization; this extends clear down to the face bosses in the mine.

Organizational Maintenance.—This study has just been undertaken and the same procedure will be followed as in the previous study—to compile individual accounts furnished from a number of companies. Six such accounts have already been received. E. R. Cooper explained that most maintenance programs involve periodic shop overhauls of equipment, as a machine, particularly on three shift operation, cannot be kept in constant service over a long period. He spoke of the advantages of a well equipped central shop where adequate repairs can be made after routine inspections have indicated that major overhauls are necessary.

Instructional Training.—This is another new subject that has just been undertaken and material is being gathered on methods used in several fields. C. R. Nailler stated that two general types of schools are being used. One gives instruction in everything from elementary mathematics to blue print reading; while this type has a great deal of merit, its disadvantage is that too long a time is required to complete a course and it does not appeal to a large number of the men. A second type of school is job training given in shops, covering the use of tools, blue print reading and general mechanical instruction on assembling and rebuild-

ing machines. In either case he stressed that any type of training must be tied in to the mine operation so that the men in the schools will realize that their training is of practical advantage. The committee report now in preparation will fully cover all of the points as outlined.

COMMITTEE ON VENTILATION

W. E. HOUSMAN, *Chairman*

A NUMBER of subjects have been discussed for study by this Committee since its organization last year, and the prevention of coal dust was considered to be a matter of first importance. A survey was conducted by sending a data sheet to a number of companies, asking for information on methods used in applying water at the working face; the replies to this data sheet were compiled and published as a preliminary report.

Coal Dust Control.—G. E. Riggs, in reviewing this report, explained that the dust feature is to some degree a new problem, or rather some new factors have been introduced by mechanical loading, and the survey indicated very definitely that coal companies were giving serious attention to this problem. He also pointed out that the survey showed no two companies were using exactly the same methods, which indicates that dust abatement is still a matter for study. W. E. Housman announced that the Ventilation Committee at a recent meeting had recommended to the Coal Division that a new Committee on Dust Control be organized to make a special study of this subject. This had since been done and D. H. Davis was appointed chairman.

New Committee Organized.—Mr. Davis, in outlining the future work of his committee, said that coal-dust control was still in a state of experimentation and some thought would have to be given to the exact procedure which would be followed and how the various factors affecting dust control would be covered. Perhaps the first step will be to evaluate the advantages and disadvantages of methods now in use, taking efficiency into account as well as cost.

Fundamentals of Mine Ventilation. The Ventilation Committee has selected as their next study the preparation of a simple set of rules and practices governing the fundamental principles of mine ventilation. Mr. Housman said that such information was really needed; that the existing handbooks were complicated by difficult mathematical formulas which were not easily understandable or usable by the average mine foreman. A more practical approach to ventilating problems seems possible and the endeavor of the committee will be to find such an approach.

Raymond Mancha outlined the need for a better understanding of ventilation requirements and mentioned that concentration of territory and group working in a modern mechanized mine had introduced a number of new factors which were not universally understood. Stephen Krickovick said that coal mine ventilation had two separate requirements. One is to establish a system from an engineering standpoint which will be adequate at the time it is established but sufficiently flexible to take care of changes that will be needed as the mine develops. The other is to have the system capable of minor adjustments that can be made by the superintendent or mine foreman which involve changing the distribution to increase or decrease certain splits. J. A. Saxe felt that a manual of simple rules was greatly needed and was possible to prepare, and he stressed that it should include instructions in the proper use of regulators for keeping a balance between the various splits of a mine.

COMMITTEE ON CONVEYOR MINING

T. F. MCCARTHY, *Chairman*

THIS committee for some time past has centered their activity on belt conveyors as being a subject of major interest in mechanical mining; a number of phases on belt operation were selected for study and considerable progress has been made.

Moving and Resetting Belt Conveyors.—This report which has been completed and published, described three conveyor operations; an advancing panel, a developing and retreating panel and a full retreating panel. E. H. Jenks stated that these reports showed three practical methods for moving and resetting the gathering belt; in one case entire equipment is moved by mine cars on a supply track laid in the belt entry; another method is to use the belt itself for transporting the frames and sections to and from the head end; in the third method the men carry the lighter parts and the mining machine rope is used to drag the heavy sections. No one method is recommended by the Committee as each has its particular advantage in the mine and under the conditions where it is being applied.

NOTE: A correction in the report on Mine B is published on page 51 of this issue.

Loading Conveyors with Shuttle Cars.—A report just completed is now ready for publication which describes several methods and devices for belt loading with shuttle cars. A shuttle car has a higher unloading rate than the carrying capacity of a belt conveyor at normal speeds and several devices are now in use between the shuttle and the belt which regulate the flow of coal on to the conveyor.

One of these is an elevating conveyor, a second is an elevator with a hopper that holds a full shuttle load, a third device is an automatic hopper located directly over the belt which serves as its own feeder. A fourth method described by Neil Robinson is to speed up the belt until its capacity approaches the discharge rate of the shuttle and he spoke of belt speeds as high as 500 ft. per minute that were operating satisfactorily.

Synthetic Belt Covering.—Underground belt conveyors are now being manufactured entirely of synthetic material and E. W. Beard explained that it was too early to make positive statements as to the life and service that could be expected. Laboratory tests have indicated that neoprene has several excellent qualities—it is resistant to oil and it will not support combustion. However, none of the synthetics show as high a resistance to abrasion as natural rubber but until actual underground use has given a background of experience, no definite comparison can be made as to the service of the two materials for mine belt coverings.

Moving Chain Conveyor.—The removal of the conveyor after a room has been completed was discussed by E. B. Gellatly who described a device which has met with some success. This is a rope hoist mounted on a tractor truck; in operation it is set on the entry at a room neck and pulls the entire conveyor forward and each section, as it reaches the mouth of the room, is disconnected and loaded into a mine car.

COMMITTEE ON SAFETY

L. C. CAMPBELL, *Chairman*

THIS committee was organized at the Coal Division Conference a year ago and subcommittees were planned to study various phases of safety, such as rules, education, rock dusting, explosions and haulage. During the year some progress was made toward completing the organization of these various subcommittees, but unfortunately the wage negotiations interfered. Several tentative dates for committee meetings proved to be in conflict with negotiation meetings in Washington and New York, which the committee members necessarily had to attend.

A number of the members had a special meeting on the afternoon of December 2, in which plans for future studies were discussed and outlined. The committee expressed regret that circumstances over which they had no control had prevented progress in their studies but assured the Conference that work would be gotten under way immediately and that reports on these various studies would soon be ready.

COMMITTEE ON SURFACE PREPARATION

T. W. GUY, *Chairman*

THIS committee has had two projects under study—methods to recover fuel values from mine refuse and tippie rejects, and substitute materials for critical metals in screen plants, and preliminary reports will soon be ready for review by the committee.

Recovery of Fuel Values.—This study, as explained by T. W. Guy, is of foremost importance to the industry at this time when the country is in need of every ton of fuel that can be produced, and there is a real possibility for the recovery of an appreciable amount of coal that is now being lost. The procedure will be to compile information on methods that are now being used, varying from hand picking to mechanical separation, and in planning their report the committee has proposed the following outline:

(A) RECOVERY FROM MINE REFUSE:

1. Examples of quantity, size, and quality of recoverable coal found in mine refuse.
2. Examples of *profitable recovery* of such coal by the use of:
 - (a) Handpicking.
 - (b) Existing facilities.
 - (c) Additional facilities at moderate and justifiable cost.
3. Successful marketing of such products:
 - (a) By blending with normal products.
 - (b) As middling products.
 - (c) For local and other special purposes.

(B) RECOVERY FROM CLEANING PLANT REJECTS:

1. (a) By improving load factor of preparation facilities.
- (b) By more accurate *adjustments and control* of the operation and the maintenance of equipment.
- (c) By retreatment of rejects where present cleaning units are overloaded or otherwise insufficient.

A discussion of this subject brought out descriptions of several plants now in operation. G. S. Osler mentioned an installation where as much as 100 tons daily is now obtained from refuse and is of sufficiently good quality to mix with the regular product. However, he mentioned that in other cases the recovery is not a high-grade coal that will compete on the open market but is nevertheless usable for special

purposes. A pilot testing plant was described by William S. McAleer; this plant was put in as an experiment and 500 tons per day which was formerly gobbled and wasted as refuse is now being treated, yielding about 200 tons of marketable coal, from 9 to 13 percent ash. He further pointed out that this type of cleaning would help the underground operation by permitting full seam mining. E. B. Winning gave an interesting account of a refuse recovery plant that treats a 25 percent ash product, and is now recovering about 600 tons per day, making a product of 11.5 to 12.5 percent ash, which is used as a steam coal.

Corrected Report Moving and Resetting Belt Conveyors MINE B

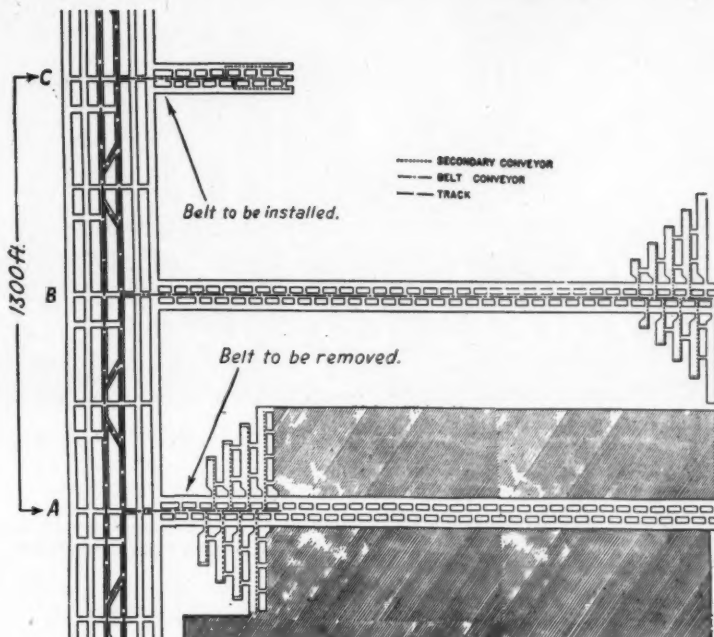
The Conveyor Committee, at their meeting on December 2, reviewed the published report on Belt Moving, and pointed out several errors in the account of "Mine B"—on page 45 of August, 1943, MINING CONGRESS JOURNAL. A revision, as now approved by the Committee, of the paragraphs on dismantling and retracting follows:

The mining system, as shown in the accompanying sketch, is room and pillar; the entries are first driven 1,500 ft. to the panel limit and the rooms and pillars are then mined retreating. The belt conveyor is used both for the advance and the retreat; in the development work the first belt set-up is 200 ft. long, which is extended at 300-ft. intervals as the entries are being driven to their maximum length of 1,500 ft. During the retreat the belt is shortened at 300-ft. intervals until it is reduced to a length of 400 ft. at the completion of the panel.

Dismantling 400 Ft. of Conveyor

The belt conveyor is cut at a splice on the return side at a point approximately 30 ft. inby from drive pulley. The inby loose end of belt is blocked or clamped to the first intermediate section, the outby loose end of the belt is pulled outby to the discharge roller, thus using only one roll to drive with. Jacks are dropped at the tail pulley, a section of conveyor adjacent to the tail pulley is dismantled into light parts and loaded onto the belt. The belt is started and two men pulling on the belt at the discharge end, the tail piece is retracted the length of the section removed. Belt is then stopped and the procedure repeated until all the sections except the intermediate sections adjacent to head section have been removed. Sections meantime have been taken off of belt as they come out to the head section.

In the meantime the loose end of belt, as it is retracted, is fed or piled



into five mine cars (cars 12 ft. long). Power unit of head section is removed and loaded into a mine car; the head section is loaded into another car; the two intermediate sections adjacent to the head section are loaded into two cars and the tail pulley takes up a car. Side frames of conveyor sections, chairs (stands) and rollers, starting boxes and wiring material are loaded into separate cars. Time for the work to this point is 6 hours, or 42-man-hours including foreman's time.

Retracting 300 Ft. of Belt Conveyor

First slightly release the belt tension by loosening the jacks at the tail end. Second, remove intermediate section immediately adjacent to the tail end and pile on the belt and run forward about 16 ft., then remove the next section and pile on the belt moved forward and so on, in turn, until 300 ft. of intermediate section are removed. All of these sections are then run to the head end and disposed of. Drop jacks of tail pulley. Next, the belt is opened at a splice on the top side approximately 10 ft. back from the head pulley and the loose inby end of the top belt is clamped. The loose outby end is pulled forward over the discharge pulley and the belt started in the reverse direction. Two men pull on the outby loose end which maintains tension on the drive pulleys and in turn pulls the tail end forward. The belting is piled into mine cars or rolled up and this operation is continued until the tail pulley is pulled forward to a point to where it is to be connected on to the conveyor that remains in place.

Time required to shorten 300 ft. of

belt is 24½ man-hours, including foreman. Splicing 30-in. belt after splice is cut requires 30 minutes for two men.

Color Standards of Distribution Power Cables

Approved by the Power Committee, December 2, 1943

1. Multiple conductor power cables for d-c distribution service.

Black—ungrounded or live conductor.

White—grounded or return conductor.

Green or un-insulated — safety ground.

2. Multiple conductor power cables for single phase low voltage a-c distribution service.

Black—phase wire.

White—neutral.

Red—phase wire.

Green or un-insulated — safety ground.

3. Multiple conductor power cables for three phase low voltage a-c distribution service.

Black—phase wire.

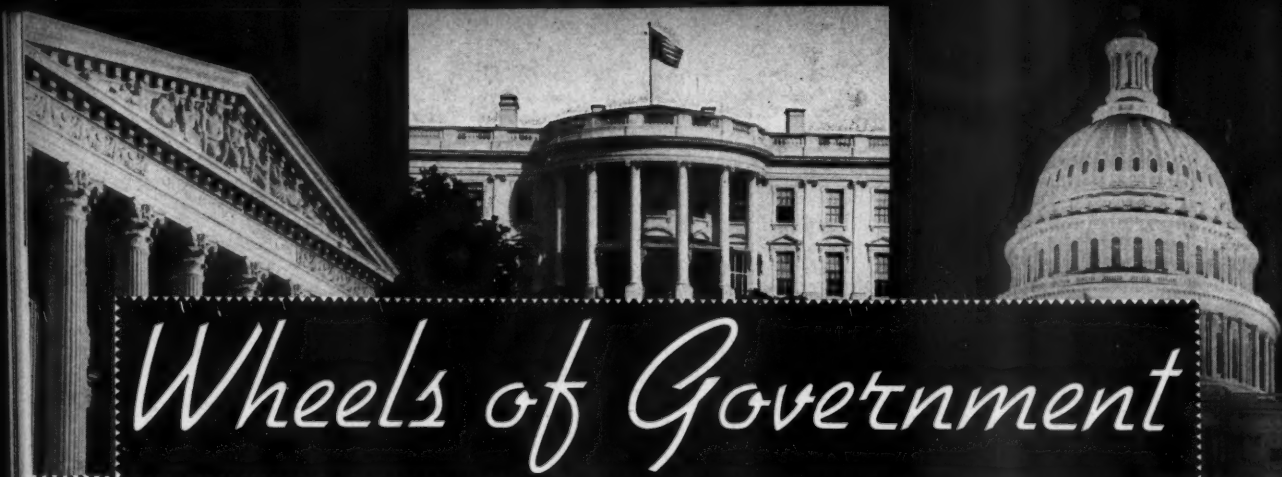
White—phase wire.

Red—phase wire.

Green or un-insulated — safety ground.

If one cable is grounded in the system the white cable is to be selected.

4. Where single conductor cables are used in either d-c or a-c service, the approved color schemes shall be followed by painting or otherwise color marking the cable ends. In such cases, the cable terminals should be made non-interchangeable mechanically if possible.



Wheels of Government

As Viewed by A. W. Dickinson of the American Mining Congress

HOME from his Teheran and Cairo journey, the President soothed Paul McNutt by issuing an Executive Order requiring the now independent Director of the Selective Service to consult with the War Manpower Chairman to assure coordination with his administration of the policies and program of WMC.

Unable to complete work on the pending Revenue Bill, and with all Representatives and many Senators anxious to spend as much time as possible in their home districts, the Congress adjourned December 21 to reconvene January 10, when much interest will surround the receipt of the President's message. Final enactment of the Revenue Bill is hardly anticipated until some time in February.

Revenue Bill to Senate Floor

As reported by the Finance Committee to the Senate December 21, the pending revenue bill increased the excess profits tax rate from 90 to 95 percent, continued the 10 percent post-war credit and left untouched the 80 percent limitation on the total tax assessable. Approved were invested capital credits of 8 percent up to \$5 million, 6 percent between \$5 million and \$10 million, and 5 percent on invested capital over \$10 million. Combined normal and surtax rate on corporations remained at 40 percent and the specific exemption from excess profits tax, increased by the House from \$5,000 to \$10,000, was also approved. The earned income credit for individuals was abolished and the Victory tax reestablished at a flat 3 percent rate on gross income in excess of \$624.

The Thomas amendment, which would have stricken the subsection terminating percentage depletion granted to certain minerals in the present bill and in the 1942 Act at

Washington Highlights

SELECTIVE SERVICE—Separated from WMC.

CONGRESS—Adjourned December 21 to January 10.

REVENUE BILL—Reported by Finance Committee.

"GROSS INCOME"—Johnson amendment now in pending bill.

AMORTIZATION—Now under WPB.

STOCKPILING—New Scrugham bill introduced.

COAL WAGES—Operator-miner contract signed but WLB and OPA must act.

ORDER P-56—WPB rewrites order.

the close of the war, was rejected; potash, however, was authorized to continue to take its percentage depletion after the war although the rate was cut from 23 percent to 15 percent.

The credit for exempt excess output of new coal and iron mines was increased from one-sixth to one-half of the net income and this was made retroactive to December 31, 1941.

The existing 1 percent payroll taxes for Social Security were frozen for 60 days through a rider attached to a minor bill which the President immediately approved. This action was necessary as an increase to 2 percent would have automatically become effective January 1, and the additional time thus provided was needed to permit inclusion of the "freeze" in the final enactment of the Revenue Bill.

The amendment introduced by Senator Edwin C. Johnson of Colorado which places in the bill a definition of "gross income from the property" was first rejected by the Committee and then a week later on December 21 was accepted and approved. Made necessary by the recent denial by the Bureau of Internal Revenue of certain treatment costs in computing "gross income from the property" for purposes of percentage depletion, the amendment specifically defines the term "ordinary treatment processes" as including, in the case of coal—cleaning, breaking, sizing, and loading for shipment; in the case of sulphur—pumping to vats, cooling, breaking, and loading for shipment; in the case of iron ore, bauxite, ball and sagger clay, rock asphalt, and minerals which are customarily sold in the form of a crude mineral product—sorting, concentrating, and sintering to bring to shipping grade and form, and loading for shipment; and in the case of lead, zinc, copper, gold, silver, or fluor-spar ores, and ores which are not customarily sold in the form of the crude mineral product—crushing, grinding, and beneficiation by concentration (gravity, flotation, amalgamation, electro-static, or magnetic), cyanidation, leaching, precipitation (but not including electrolytic deposition), or by substantially equivalent processes or combination of processes used in the separation or extraction of the product or products from the ore, including the furnacing of quicksilver ores.

It is provided that the Johnson amendment shall be effective as if it were a part of the Internal Revenue Code, the Revenue Act of 1938, the Revenue Act of 1936, the Revenue Act of 1934 and the Revenue Act of 1932, on the date of its enactment.

In the Finance Committee's report, the following language is notable:

"The purpose of the provision is to make certain that the ordinary treat-

ment processes which a mine operator would normally apply to obtain a marketable product should be considered as a part of the mining operation, and to give reasonable specification of what are to be considered such processes for various kinds or classes of mines. The law has never contained such a definition, and its absence has given rise to numerous disputes. The definition here prescribed expresses the congressional intent of these provisions as first included in the law, and is in accord with the original regulations and the Bureau practices and procedures thereunder. It is, therefore, made retroactive to the date of such original provisions."

On war contract renegotiation, Committee action provided that price adjustment boards give consideration to estimated taxes in ruling on excessive profits; that appeals from settlement go to the Court of Claims rather than the U. S. Tax Court; that exemption of standard commercial articles be mandatory, including those identical in every material respect with articles in general civilian, industrial or commercial use before January 1, 1940, articles similar to those sold as a competitive product and made by more than one manufacturer, or having the same uses as a competitive product, also articles under price ceilings or sold for not more than the January 1, 1941, price; that the new definition of subcontractor (to include only producers of articles becoming component parts of final products) be made retroactive to April 28, 1942; that renegotiating officers be prevented from ordering cuts in prices specified after termination of hostilities; and that renegotiating officers give consideration to profits after taxes and to probable reconversion costs in determining the extent to which profits from war contracts are excessive. Also required was the inclusion in all contracts and subcontracts of a provision for the allowance of costs in the same manner as for income tax purposes, including amortization. Approved was the House amendment exempting contractors with annual renegotiable business of less than \$500,000, the provision for annual renegotiable returns by contractors, the requirement that price adjustment boards furnish a written statement of the basis for their determination, and the power to make final closing agreements which may not be reopened.

Throughout all of the controversy over renegotiation, the exemption of mineral raw materials granted in the 1942 Act was continued.

Amortization Control in WPB

In issuing the Executive Order which has transferred the authorization for the amortization of war facilities from the Departments of War

and Navy to Chairman Donald M. Nelson of the War Production Board, the President supplemented his October 5 approval of the amendment to the War and Navy Department's Regulations. This amendment provides that the special allowance for amortization of emergency facilities would in the future be granted only in exceptional cases. Stating that with few exceptions the Nation now has the capital equipment needed for the completion of the war production program, WPB Chairman Nelson has arranged that taxpayers' applications for necessity certificates will be handled by Carman G. Blough as Deputy Director of the Facilities Bureau for Tax Amortization. In cases where construction has not been started or facilities have not been acquired, it is specified that the applications for specific authorization or for necessary priority assistance should be filed simultaneously.

Hershey Heads Independent Agency

Included in the new law authorizing the drafting of fathers, was the additional provision under which administration of the Selective Training and Service Act of 1940 is vested, through the President, in the Director of Selective Service. This law removed the Selective Service from Paul McNutt's War Manpower Commission. Executive Orders issued from the White House have appointed the Director, General Hershey, a member of the WMC and as a coordinating move have included the specification that "the Director shall consult with the Chairman of the War Manpower Commission (a) on all matters arising in the administration of the Selective Training and Service Act of 1940, as amended, including all matters with respect to rules, regulations, and other instructions of general application (irrespective of the form thereof) relating to the classification or deferment of registrants, which may affect the execution of the Chairman's responsibilities for the most effective utilization and mobilization of the Nation's manpower and (b) on all matters necessary to assure that the administration of the said Act is coordinated with the administration of the policies and program of the Chairman of the War Manpower Commission."

Scrugham Revises Stockpile Bill

Early in December, Senator James G. Scrugham of Nevada reintroduced his stockpiling bill, now also sponsored by Senators Hayden of Arizona, Murray of Montana, Johnson of Colorado, and Maybank of South Carolina. Primary purpose of the measure is to establish a sufficient and readily available supply against any future national emergency of the metals and minerals in which this country found

itself so sadly wanting at the beginning of the present war. It is designed not only to impound surplus metal stocks at the close of the war but also to guard the welfare of the small domestic producers of strategic and critical metals and minerals.

The new bill would create a Mineral Stockpile Control Board composed of five outstanding members of the mining industry and directed to consult with the Secretaries of War and Navy. These Departments may not dispose of metals and minerals in their possession after the war except of course for bona fide Government use. Minerals acquired under Lend-Lease repayments are to be added to the stockpile. Omitted is the authorization for Government establishment and operation of beneficiating, reduction or processing plants but Metals Reserve Company may contract for treatment of minerals for stockpile purposes.

Under the definitions in the revised bill "mineral" is designated as "any ore, concentrate, metal not fabricated into finished form, or mineral" designated as strategic or critical during the present war or subsequently deemed by the Board to be strategic or critical. "Domestic source" means "any mine, mine dump, tailing dump, slag dump, mineral deposit or other source of mineral" located in the United States territory. "Small or marginal mine" is defined to include any mine so designated by Metals Reserve Company within the intent of the Act, and it is stated that a part only of the production of such mine may be determined by the MRC in fact to be marginal.

The Mineral Stockpile Control Board is directed to include in its semi-annual report and recommendations to Congress recommendations for specific legislation permitting the Board to dispose of any minerals no longer deemed by it to be strategic or critical for the purposes of the Act.

No additional hearings are expected on this Scrugham bill and further action awaits the report by the Senate Mines and Mining Subcommittee.

Coal Wage Contract Signed

The joint wage conference of coal operators and miners on December 17 signed a contract stated to be within the framework of the Government-worker contract made by Secretary Ickes with John Lewis in reopening the mines December 3. The agreement extends to March 31, 1945, although its operation still depends upon approval by the War Labor Board, and the granting of price increases by OPA sufficient to cover the increased cost of production. The new contract may be reopened on 30 days' notice from either party at the end of the first contract year, March 31, 1944.

(Continued on page 69)



Short, short story



Using only 18 pounds of Anaconda "997" Low Fuming Welding Rod, the Hebelor Welding Co. of Buffalo, New York, repair-welded this eccentric housing for the Ushco Mfg. Co., Inc., in less than 20 man-hours.

Important war production plant...

Eccentric housing breaks on drop forge hammer...

Welded with Anaconda "997" Low Fuming...

Hammer back on job next day!

That's the way low-temperature Bronze welding is helping out in emergencies these busy days. A broken 2½-ton gear was returned to service in less than a week; a seven-foot fracture in a 6-ton press column was repaired in three days; a fractured 2-ton section of a 100" boring mill was repair-welded in 39 hours.

And so it goes—in every branch of industry, on every type of equipment—on parts made of

cast iron, steel, malleable iron and copper alloys.

Keep in mind this modern method of salvaging costly machine tools, production parts and equipment—at a fraction of the cost of new replacement parts. Keep in mind also that Tobin Bronze*, "997" Low Fuming and other Anaconda Welding Rods are preferred by many industrial shops for making dense, high strength, Bronze welding repairs.

*Reg. U. S. Pat. Off. 4578

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.



Anaconda Welding Rods

PERSONALS..

George L. Craig has been appointed director of research of Calumet and Hecla Consolidated Copper Company. The announcement was made by A. E. Petermann, president, on December 6. Mr. Craig, metallurgist and research engineer, joined the Calumet and Hecla organization in 1934, and prior to that was engaged in research work with the Battelle Memorial Institute. He will make his headquarters in Calumet, Mich.

Robert H. Morris, general manager and a director of the Gauley Mountain Coal Company, was elected vice



president in charge of operations at a meeting of the board of directors on December 7. Mr. Morris has been with the company since 1917. M. L. Alley was elected general manager.

R. L. Suhl, manager, Nickel Sales Department, the International Nickel Co., Inc., announces that Reuel E. Warriner, having completed his assignment with the tank automotive center of the Army Ordnance Department, has resumed duties with the International Nickel Co., Inc., and is now supervising the movement of nickel required to meet the demands of the steel industry. Mr. Warriner will make his headquarters in the New York office of International Nickel.

Lt. Col. Robert P. Koenig, president of Ayrshire Patoka Collieries Corporation has returned to the Mediterranean theater following a recent visit to Washington. He is serving as chief of the mining division, Allied Control Commission, with responsibility for sulphur mining operations in Sicily; lead-zinc coal mining operations in Sardinia, and aluminum ore production in Italy.

Dr. H. Foster Bain, who was caught in December, 1941 by the Japanese invasion of the Philippines and interned at Santo Tomas University, in Manila, P. I., recently returned to the United States on the S.S. *Gripsholm*, reaching New York, December 2.

David W. Jones, for the past seven years general superintendent of the Kings Station Mine of the Princeton Mining Co., Princeton, Ind., has resigned his position effective January 1, and will become associated with Paul Weir Co., mining engineers and geologists. For 15 years before his association with Princeton, Mr. Jones was with the Valier Coal Co. as electrical engineer and general superintendent, where he developed the use of large capacity drop-bottom mine cars for shuttle service.

E. M. Johnson, of Henryetta, Okla., has retired from his long connection with the Eagle-Picher organization. This retirement comes after 27½ years of service as superintendent and subsequently as manager for the Eagle Picher Lead Co., and, later, the Eagle-Picher Mining & Smelting Co.

L. Ebersole Gaines, president of New River Company and vice president of West Virginia Coal Association; D. A. Thomas, vice president of Southern Coal & Coke Co.; Charles O'Neill, president of United Eastern Coal Sales Co.; and Duncan Kennedy, secretary of Kanawha Operators Association, have been appointed by Secretary Ickes to a committee looking to developing a policy to govern wage rates for coal loaders and piece workers.

Charles R. Kuzell, manager of the United Verde branch of the Phelps Dodge Corp., has been transferred to Douglas, Ariz., where he will handle the labor relations of Phelps Dodge copper mining operations.

Frank C. Croxton has accepted a position as supervisor of organic chemistry at Battelle Memorial Institute, Columbus, Ohio. Dr. Croxton has been associated with the Institute since 1939 as assistant supervisor of organic chemistry.

Roland Whitehurst, assistant sales manager of The Electric Storage Battery Company since 1940, has been assigned the title of sales manager, effective January 1, 1944. Mr. Whitehurst has been in the employ of the company since 1908, and was manager of its Washington Branch for 20 years.

F. H. Wagner, consulting engineer, Wilkes-Barre, Pa., has gone to Peru for the purpose of developing a mining property for the Peruvian government. For many years, Mr. Wagner was general manager of the Lehigh Valley Coal Company, Wilkes-Barre.

Announcement of the retirement of J. O. Elton as Manager of the International Smelting and Refining Com-



J. O. Elton

pany and the appointment of Frank A. Wardlaw, Jr., to succeed him, was made on December 14 by J. R. Hobbs, president of the Anaconda Copper Mining Company of which International is a subsidiary.

Governor Martin, Pennsylvania, recently announced the appointment of W. H. Lesser, Scranton, as a member of the board of examiners for the registration of professional engineers in the state of Pennsylvania.

Fred Jones, of Denver, has been appointed State Commissioner of Mines for Colorado, succeeding Edward P. Arthur, who was killed last August when his car left the highway near the Treasury Tunnel. Mr. Jones is a graduate of the Colorado School of Mines, and was formerly superintendent of the Portland mine at Cripple Creek.

John T. Sydnor, formerly vice president in charge of operations, West Virginia Coal & Coke Corp., has been appointed president of the Rail & River Coal Co., Bellaire, Ohio.

E. P. Holder, president of Wickwire Spencer Steel Company, announced on November 18 the appointment of Robert T. Dunlap as assistant to the president. Mr. Dunlap is well known in the steel industry as an authority on plant installations, production and operation.

Effective January 1, 1944, George H. Sambrook was appointed Safety Director for the H. C. Frick Coke Company and Associated Companies, succeeding Clyde L. Lutton, retired as of December 31, 1943. Mr. Lutton will be retained temporarily in advisory capacity.

Dr. Paul D. V. Manning, director of research since 1941 for International Minerals & Chemical Corporation, Chicago, has been elected a vice president of the company.

Thomas G. Fear, safety director, Hanna Coal Co., St. Clairsville, Ohio, has been appointed chief engineer for the company.

Roy A. Hunt, president of the Aluminum Co. of America, Pittsburgh, and Dr. Zay Jeffries, technical director, lamp department, General Electric Co., Cleveland, were honored at the recent annual dinner of the American Society for Metals in Chicago. Mr. Hunt was awarded the A.S.M. Medal for the Advancement of Research. Dr. Jeffries received the gold medal of the American Society for Metals.

P. R. Paulick has resigned as general superintendent for Akron Coal Co., to enter private practice as consulting mining engineer. Mr. Paulick was previously with Powhatan Mining Co. and Princeton Mining Co.

W. C. Carter, president of Link-Belt Company, Chicago, announces the election by the Board of Directors of two vice presidents, effective January 1, 1944.

E. L. Berry, vice president and general manager of Link-Belt Ordnance Company, has been elected vice president of Link-Belt Company, the parent organization. Mr. Berry, who began his Link-Belt career in 1914, has for many years devoted his time particularly to matters of production and personnel. His new headquarters will be at the company's general office, 307 N. Michigan Avenue, Chicago.

Richard F. Bergmann, company chief engineer, has been elected a vice president of Link-Belt Company, with headquarters at the company's general office, Chicago, as heretofore. Mr. Bergmann came to Link-Belt in 1924, through the purchase of Howe Chain Co., Muskegon, Mich.

John E. Martin has been appointed manager of Link-Belt Ordnance Co., with headquarters at the plant. Mr. Martin started his Link-Belt career in 1927, and since Pearl Harbor has been assistant to Brigadier General G. M. Wells, War Department, Washington, D. C.

— Obituaries —

Glen A. Knox, 62, superintendent of the Gunn-Quealy Coal Company, passed away Tuesday, December 21, at the Wyoming General Hospital, Rock Springs, Wyo., following a 10-day illness from a heart condition. Interment was at Rock Springs.

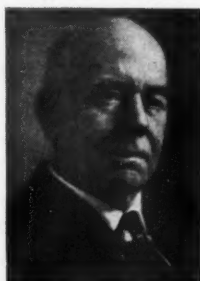
Mr. Knox was widely known



throughout the coal industry with which he had been identified since 1907 and had taken a prominent part in local and national mining associations as well as various other civic and social activities. He is survived by his wife and daughter, Staff Sergeant Betty Knox, who is serving with the WAC.

Joseph A. Hunter, 68, mining engineer and attorney, and resident of Tucson, Ariz., for more than 30 years, died in Tucson on November 24.

Edward Wheeler Parker, for many years director of the Anthracite Bureau of Information, until his retirement in 1939, died January 8 in Philadelphia. Widely known among mining men, Dr. Parker was in charge of the Division of Mines and Minerals, U. S. Census 1890-1901. He served



with the U. S. Geological Survey as statistician and in charge of the Division of Mineral Resources from 1901 to 1915. He was the author of many reports on coal and coke production, phosphate rock, gypsum, salt, antimony, asphalt and briquettes. Dr. Parker was born at Port Deposit, Md., June 16, 1860.

William Wise Miller, 65, died at home in Charleston, W. Va., on December 13. Mr. Miller was treasurer and general manager of the Hatfield

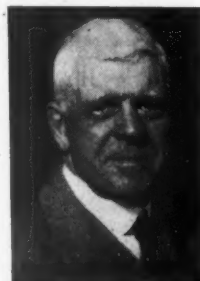
Campbell Creek Coal Company and a director and vice president of the Lincoln Coal Company of Cincinnati, Ohio. He was a former president of the Kanawha Coal Operators' Association and at present a vice president of that organization.

Albert Emerson Vandercook, internationally known mining engineer and metallurgist, died recently in Sacramento, Calif., after an illness of several months. He was general manager for the Central Comstock Mines Corporation, operating the middle group of old bonanza properties on the Comstock lode, and was constructing a cyanide mill at the Hale & Norcross tunnel when stricken with illness.

He had operated throughout the West, in the Philippines and Malaya and was the inventor of a variant of the cyanide process that had achieved outstanding success.

William J. Borries, president, general manager and mining engineer, connected with Dawson Daylight Coal Co., Dawson Springs, Ky., died late on November 28, at a hospital in Madisonville, Ky., of pneumonia, after an illness of several days. Mr. Borries had not been in good health for more than a year, having suffered a stroke in 1942.

William G. Irwin, nationally prominent industrialist, financier and philanthropist and one of the key figures in the development of this country's diesel engine industry, died suddenly



on December 14 in Indianapolis. Mr. Irwin's death, attributed to heart failure, occurred in his office. He was 77 years old. Through Mr. Irwin's association with Clessie L. Cummins, the Cummins Engine Company was established. Mr. Irwin as Chairman of the Board of Directors was continuously active in the company until his death.

Greene H. Bolin, 67, Arizona's first mine inspector, died in Phoenix on December 1, closing a mining career begun 54 years ago in Bisbee. He was employed by various mining companies before he turned to mine contracting and brokerage.

M. C. (Sel) Tarr, 70, known as a typical "old-time" miner, died suddenly in Mammoth, Ariz., on November 19, after a heart attack. He began working in mines at the age of 12 years.



News and Views

WPB Issues Revised P-56 Order Covering All Mines and Smelters

MINING priority controls were both simplified and eased somewhat by a complete revision of WPB's General Preference Order P-56, issued on December 24. Heretofore, domestic mines operated under Order P-56, foreign mines under Order P-58, and smelters under Order P-73. Orders P-58 and P-73 are now revoked and the priority controls for all mines and smelters are covered by the new Order P-56, which continues the unified handling of the industry through WPB's Mining Division.

Possibly the most important change in the new order is the provision allowing limited purchases of capital equipment items through merely an endorsed rating. This was accomplished by making the definition of "maintenance, repair and operating supplies" of the order to include "minor capital additions normally necessary to the operation of the enterprise, but not exceeding in cost \$500 (excluding purchaser's cost of labor) for any one complete capital addition." The order emphasizes, however, that "one complete capital addition" includes a group of items normally purchased together and all items normally purchased as part of a single project or plan; also, that no capital additions shall be sub-divided for the purpose of coming within these provisions. For the first and second quarters of 1944, a dollar value quota for such minor capital purchases will be granted holders of serial numbers upon application by letter to WPB's Mining Division. For the third and subsequent quarters, it is expected that the regular quota application forms will be revised to provide space for this application. In filing applications for this dollar value quota of minor capital purchases, mines and smelters are cautioned that their request should be in line with their previous experience in the purchase of such items.

All serial numbers granted to mines

under the previous P-56 order and in effect December 24, 1943, were continued under the new order. All serial numbers heretofore issued under Orders P-58 and P-73, and not cancelled prior to December 24, were considered as having been issued under the new Order P-56.

Another of the important changes in the order is that smelters are now to operate under the same inventory provision as mines, instead of being subject to CMP Regulation No. 2. The inventory restrictions of the amended order are identical with those of the earlier P-56 and P-58 orders, namely, that inventory of any material cannot exceed the minimum necessary to sustain the current level of operations, and the ratio of such inventory to current production shall in no event exceed the ratio of average inventory to average production for the years 1938, 1939, and 1940.

Paragraph (g) of the new order provides a simplified form of certification for purchase orders, and specifically states that the symbol "MRO" shall not be used in any case. Also, that preference ratings assigned on the quarterly quota Forms WPB 2937, 2938, 2939, and 2040, may not be used to obtain items on List A or List B of Priorities Regulation No. 3; these list products for which ratings may not be used at all or for which certain kinds of ratings may not be used, such as track-laying tractor repair parts, central steam heating, fire protective equipment, fuel, etc. It also states that purchases made without the use of preference ratings need not be charged against authorized dollar-value quotas.

The restrictions on use and resale of material now provide that any material, *whether or not obtained pursuant to this order*, may not be used for any purpose other than that for which priorities assistance was granted, except that resale may be made (1) to a serial number holder,

(2) by written approval of WPB, (3) by written approval of a Foreign Economic Administration mine supply control district, if a non-serialized producer in such district, or (4) as permitted by the provisions of Priorities Regulation No. 13 (which sets forth the classes of buyers permitted for specific products).

The amended order expressly states that none of the restrictions of CMP Regulation No. 5 (the general MRO order) shall apply to mines and smelters, and that they shall not obtain any material under CMP Regulation No. 5. However, mines and smelter are granted any privileges that may be given under other WPB orders or regulations to persons operating under CMP Regulation No. 5.

Applications for machinery, materials and equipment (other than now included under maintenance, repair and operating supplies) will continue to be made to the Mining Division on Form WPB-2910. Even in cases where another WPB order or regulation requires the filing of a special application with some other division or office of WPB, prior application must be filed on WPB 2910 with the Mining Division to enable them to screen such applications and render all possible aid in approved cases. It is expected that a common application form will soon be adopted by WPB, after which time this provision for double applications will be deleted.

Non-essential mines, as defined in Limitation Order L-208, are specifically excluded from the new P-56 order. Thus gold mines not granted serial numbers may apply for maintenance materials only under the terms of L-208, which requires special application to the Mining Division in each instance.

The AA-5 preference rating for maintenance, repair and operating supplies for non-serialized operations is continued, but limited to producers within the United States, its territories and possessions. Such non-serialized operations may apply to the Mining Division on Form WPB 2910

for priorities assistance on mining machinery or equipment, or for further assistance for maintenance, repair and operating supplies. Special procedure for emergencies is set forth. Foreign producers, not holding serial numbers and not located in a mine supply control district must apply for all priorities assistance on Form WPB 2910.

Copies of the new order may be secured through any of the War Production Board's offices, or through the American Mining Congress, Washington, D. C.

Coal Mine Inspectors Sought

The U. S. Civil Service Commission has announced a new examination for coal mine inspectors to fill positions in the field service of the Bureau of Mines. Positions pay from \$3,163 to \$5,228 a year, including overtime, and require from five to eight years of practical experience in coal mining. Experience connected with safety-of-operation of coal mines is required and applicants must have done some specialized work in a supervisory capacity. Applicants will be rated partly on a written test, which will include questions based on the specific knowledge required of coal mine inspectors and will test the applicants' ability to make written reports. The minimum age is 30 years, the maximum 55 years.

Applications must be filed with the U. S. Civil Service Commission, Washington 25, D. C., not later than January 20, 1944. Application forms may be obtained at first- and second-class post offices, from the Commission's regional offices, or direct from the Civil Service Commission in Washington, D. C. Persons using their highest skills in war work should not apply. Federal appointments are made in conformance with War Manpower Commission policies and employment stabilization plans.

Britain Prepares for Coal Mine Labor Draft

Two small squares of folded paper, each bearing a number between zero and nine, were drawn from a box in the office of Ernest Bevin, Minister of Labor, on December 14. All men born in Britain during or after 1918, whose national service registration certificates end with one of these numbers, will be liable to direction to work in the coal mines any time after January 1. The only persons exempt are men accepted for flying duties with the Royal Air Force or the Fleet Air Arm, those qualified as artificers in submarines and those whose names

appear on the short list of highly skilled occupations.

The men affected by the draw will be notified in due course. They will be required to undergo a drastic physical test to determine their fitness to work underground, and will then be

sent to a training school at a new mining center. The conscripted miner will have two weeks' instruction at the collieries before going to the coal face, and for at least a month underground they will be personally supervised by experienced miners.

New Accident Report Form Wins Award of Excellence for W. W. Adams

William W. Adams, supervising statistician in the Bureau of Mines' Economics and Statistics Service, was granted an award of excellence on December 4, 1943, by Secretary of the Interior Harold L. Ickes for his part in designing a new and simplified accident report to serve the coal-mining industry and the Federal and state governments.

Mr. Adams, who resides at 1103 Clifton Street, N. W., Washington, D. C., is one of the 18 Interior employees who have received special awards under the Department's policy of honoring those who make outstanding contributions to wartime service rendered by the Department on the home front.

The new accident-report system for which Mr. Adams was rewarded not only simplifies the method of reporting accidents but likewise is saving thousands of man-hours for mining companies, while at the same time making accident reports uniform. It

now is being used in states producing 85 percent of the nation's coal. The system was adopted as a result of a cooperative agreement among the

Bureau of Mines, the National Coal Association, and mining officials of various states, and replaces and standardizes in those states the forms used previously. Before the new system was adopted, coal-



mining companies had to fill out two or more forms on the same mine accident. Under the new arrangement a single report on an injury or fatality, filled out with two or more carbon copies, suffice to transmit the same information.

Eastern



States

KENTUCKY

» » » At the annual meeting of the Harlan County Coal Operators' Association the following officers were reelected for the coming year: Chas. S. Guthrie, president; R. E. Lawson, vice president; and George S. Ward, secretary. Members of the executive board are: Pearl Bassham, C. V. Bennett, Kenes Bowling, R. W. Creech, Jr., W. J. Cunningham, S. J. Dickenson, J. S. Greene, Elmer D. Hall, J. Springer Robinson, J. E. Taylor, and A. F. Whitfield, Jr.

Elmer R. Kaiser, assistant to the president of Bituminous Coal Research, Inc., was present and delivered an address on the activities of that organization, accompanying his talk by photographic illustrations. At the banquet the guest speaker was Capt. Ted McDowell, publicity director at Fort Knox, Ky.

» » » Additional fluorspar for use in the manufacture of steel, aluminum, 100-octane gasoline, insecticides, and other war necessities may be found to occur in the Senator mine area in Caldwell County, Ky., according to a preliminary report released for public inspection by W. E. Wrather, Director of the Geological Survey, Department of the Interior.

According to Geologist William R. Thurston, author of the report, fluorspar mineralization has been demonstrated by mining operations and prospecting at several places along faults that cross properties in the vicinity of the Senator mine. Deposits of minable width and grade have been found at some of these places. The fluorspar occurs in veins along the faults. The Geological Survey report shows a network of faults totaling 23,000 ft. in length within an area of about 475 acres, and states

that other concealed faults may be revealed if additional geologic work and drilling are done. Copies of this report may be consulted at the offices of the Geological Survey in Washington, D. C., and at 119 West Eighth Street, Rolla, Mo. A copy has also been placed in the post office at Marion, Ky., where it may be consulted on request to the local postmaster.

WEST VIRGINIA

» » » The annual convention of the Central Appalachian section, American Institute of Mining and Metallurgical Engineers, was held in Charleston, W. Va., on December 3 and 4. The program was devoted to discussions of technical subjects and the annual banquet was addressed by Carrol D. Huntress, vice president, Republic Coal & Coke Co., New York.

George E. Keller, manager of the Charleston office of the Commercial Testing and Engineering Company, was elected chairman of the section for the coming year, succeeding L. I. Cothern, professor of mining engineering at V. P. I., Blacksburg, Va. Other officers elected for the coming year include E. R. Price, general superintendent, Inland Steel Company, Wheelwright, Ky.; President C. E. Lawall, of West Virginia University, Morgantown, W. Va.; and A. F. Shoffstall, of Huntington, all vice chairmen. G. R. Spindler, assistant professor of mining at West Virginia University, was reelected secretary-treasurer.

» » » A sale of the stock of the Arkwright Coal Company of Northern West Virginia was made to the Consolidation Coal Company early in December. It was then disclosed the Arkwright company had made a new lease with the Cochran Coal and Coke Company with an option to purchase at a price of \$1,025,000 for 450 acres.

» » » The West Virginia Workmen's Compensation Commission has released wage figures for 111,730 coal company employees showing an October earning of \$22,493,356, or an average wage per employee for the month of \$201.31. This is compared to an average of \$202.72 paid to 113,981 workers in September. Due to the revised contract which went into effect in November it is anticipated there will be a sharp increase by reason of the longer working day, travel and overtime. Putting this new contract into effect developed a myriad of headaches for the pay-roll workers and a series of sporadic strikes throughout the state. The strike element still breaks out at intervals, principally from the lack of comprehensive interpretation to the workers, and can be expected to

continue at places where the working and wage conditions have not been made clear.

» » » The West Virginia Coal Mining Institute held its 36th annual meeting at the Daniel Boone Hotel, Charleston, W. Va., November 12-13, 1943. The following officers were elected for the year 1944: D. L. McElroy, Consolidation Coal Co., president; Laurence Tierney, Eastern Coal Corp., Joseph Pursglove, Jr., Pursglove Coal Mining Co., J. J. Foster, Island Creek Coal Co., William Findlay, Jr., Simpson Creek Collieries Co., and R. H. Morris, Gauley Mountain Coal Co., vice presidents; G. R. Spindler, West Virginia University, secretary-treasurer; Jesse Redyard, West Virginia Department of Mines, C. W. Connor, Colcord Coal Co., W. G. Crichton, Johnstown Coal & Coke Co., T. E. Johnson, Northern West Virginia Coal Association, and John T. Sydnor, Rail & River Coal Co., executive board.

During the two-day session papers were presented by Jesse Redyard, Chief, West Virginia Department of Mines; Cloyd M. Smith, Mechanization, Washington, D. C.; W. E. E. Koepler, secretary, Pocahontas Operators' Assoc., Bluefield; Carl Scholz, consulting engineer, Charleston; Colonel Harley H. Thompson, West Vir-



ginia State Selective Service; Charles T. Holland, School of Mines, West Virginia University; Marcellus H. Stow, Mining Equipment Division, Washington D. C.

At the annual dinner C. W. Connor, vice president, Colcord Coal Company, presided as toastmaster.

I-T-E and the Mining Field

Developments of the past ten years in mining methods have led to a very wide use of I-T-E air-immersed circuit breakers and switchgear. Consistent study of mining problems has kept I-T-E in the forefront with the result that I-T-E equipment has been a vital factor in mechanized practices.

Automatic Reclosing Circuit Breakers

I-T-E automatic reclosing circuit breakers with load measuring characteristics are widely used in mines where d-c trolley and feeder systems are employed and where overload peaks and faults arise frequently. Type KSA is for substation use in protecting and controlling semi-automatic or full automatic M-G sets, rotary converters and mercury-arc rectifiers. Type KSC is used in sectionalizing service to localize faults. Sectionalizing provides for maximum production at reduced cost for power, for electrical maintenance and machine repairs.

Fig. 1



Fig. 1 (left) is a Type KSC automatic reclosing circuit breaker for sectionalizing service. Steel enclosure is open.

Fig. 2 (right) shows a Type KSA automatic reclosing circuit breaker for substation service.

Fig. 2

Load Distributors

Type LDR Load Distributor, panel mounted, in glass front, dust-proof cover.

Fig. 3

I-T-E Type LDR Load Distributor improves service from two or more M-G sets or rotary converters in parallel on same system but widely separated. Generator loads are balanced to prevent over-heating, outages are reduced, peaks are limited and life of system and connected equipment prolonged.

Automatic Switchboards for Mines

I-T-E has designed and built many switchboards in recent years for semi-automatic or full-automatic protection and control in connection with local generating systems or purchased energy. The switchboards are for service with M-G sets, rotary converters and mercury-arc rectifiers. Much of the equipment, including circuit breakers and protective relays, has been designed specifically for mining service. Mounting is simplified and there is much flexibility in space arrangements. A typical installation is at right, above. (Fig. 4.)



Representatives in Principal Mining Areas

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That's where your leadership comes in—and the lead-

ership of every one of your associates, from plant superintendent to foreman! It's your job to see that your fellow workers are sold the finest investment in the world. To see that they buy their share of tomorrow—of Victory!

That won't prove difficult, if you organize for it. Set up your own campaign right now—and don't aim for anything less than a 100% record in those *extra \$100 bonds!*

And here's one last thought. Forget you ever heard of "10%" as a measure of a reasonable investment in War Bonds under the Pay-Roll Deduction Plan. Today, thousands of families that formerly depended upon a single wage earner now enjoy the earnings of several. In such cases, 10% or 15% represents but a paltry fraction of an investment which should reach 25%, 50%, or more!

Now then—Up and At Them!

Keep Backing the Attack!—WITH WAR BONDS

This space contributed to Victory by **THE MINING CONGRESS JOURNAL**

This advertisement prepared under the auspices of the United States Treasury Department and the War Advertising Council

» » » The 1943 annual meeting of the Winding Gulf Operators Association was held in the Association's office at Beckley, W. Va., on December 9. Officers elected for the coming year are as follows: president, E. S. Pugh, Lillybrook Coal Co.; vice president, W. P. Tams, Jr., Gulf Smokeless Coal Co.; treasurer, S. A. Caperton, Slab Fork Coal Co. Hal M. Scott of Beckley was reelected secretary.

PENNSYLVANIA

» » » Developments in the bootleg mining industry are many. They show that decided efforts are being made to stop this business at a time when legitimate mines can give bootleg miners plenty of work. The semi-official Anthracite Committee originally asked the industry to cease operating on November 30. Governor Martin sympathized with the miners, advising them to get leases on their lands and become regular operators. Judge Paul, Schuylkill, helped the industry when he dissolved a preliminary injunction and dismissed bills in equity brought by a state mine inspection to stop bootleg miners from using gasoline engines in bootleg mines. The United Mine Workers of America also struck the industry a blow when they issued an order that no bootleg coal could be sold to legitimate operators unless the miners joined the union. It is a question as to just what will become of the industry, but it seems at this time that much bootleg coal will be mined for years to come.

» » » Minimum quality standards for anthracite coal for domestic use have been established by the Solid Fuels Administration to prevent non-burnable coal from entering the market. These standards are: egg, stove, nut, and pea not more than 15 percent ash by volume on a dry basis;

No. 1 buckwheat, 16 percent ash; and No. 2 buckwheat, 17 percent. For the purpose of checking the quality of the coal shipped, the Anthracite Committee has engaged four coal inspectors who will visit the various collieries in the entire region. The Solid Fuels Administration has obtained the services of R. Y. Williams, Pottsville, who will represent the Administration in any investigation having to do with appeals from operators who claim they cannot meet the required quality standards.

» » » For the first time in the history of the anthracite industry, it has been found necessary to place men at the offices of the United States Employment Service for the purpose of recruiting workers. Efforts are being made to move unemployed men from the Scranton area to Luzerne County, where a distinct manpower shortage exists.

ALABAMA

» » » The Dogwood mine, of the Little Gem Coal Company, in which a fire has been raging for several weeks, starting during the period of strike idleness, has been ordered sealed by the Alabama mine inspection officials, and will likely be out of production for a long period.

TENNESSEE

» » » The first completely mechanized coal mine in the southern Appalachian field, which will also be powered by electricity, is now in an advanced stage of development. The mine is located in Morgan County, Tenn., and will be operated by Mahan-Cheeley Coal Co. and the Emory River Railroad Co., subsidiaries of the Southern Coal and Coke Co. Mobile loaders, shuttle cars and belt conveyors will be included in the mechanization set-up.

the steady and rapid increase in stocks.

When the order was issued in June, 1942, that the statistics from then on would be made available only to Government agencies and industry members, the stocks of zinc in the United States, as of May 31, 1942, amounted to only 18,447 tons. It is now disclosed that they have increased every month thereafter until at the end of November, 1943, they reached the record-breaking total of 159,853 tons. During the depression in 1930 stocks reached a peak of 145,139 tons, and in 1938, following the short-lived boom of 1937, they reached 149,671 tons, or 10,000 tons less than where they stand today. It is evident why zinc has been removed from the most critical list and why producers are becoming apprehensive as to the situation which will confront the industry when there is a relaxation in war demands. Up to the present there has been no relaxation in demands for home account, domestic shipments in November of 73,364 tons having been, with the single exception of May, 1943, the highest recorded for any single month, but the requisitions of our Allies have gone way down with the result that our exports during the 11 months ending November were some 86,000 tons less than during the corresponding period a year ago and appreciably lower than they were even during 1940 and 1941. It is principally on this account that a large reserve stock has been accumulated.

Another indication of the altered position is pointed out by *The American Metal Market* in the fact that at the end of January, 1942, one month after Pearl Harbor, zinc producers had unfilled orders on their books in the amount of 110,552 tons, against which there were stocks of 23,935 tons, whereas as of November 30, 1943, unfilled orders were down to 42,151 tons while stocks were up to 159,853 tons. In other words, two years ago the producers' unfilled orders were four and one-half times the amount of stocks, while now they amount to only one-quarter of the surplus.

The following table shows average monthly production, domestic and foreign shipments for the past six years, and provides an insight into the change which has come about in the zinc situation.

Average by months:

	Production	Shipments— Domestic	Export	Stock at end of period
1938.....	38,082	32,963	2	126,769
1939.....	44,850	49,914	0	65,995
1940.....	58,842	56,218	7,347	17,582
1941.....	71,996	62,606	8,849	24,066
1942.....	77,481	61,160	12,637	65,268
1943*.....	80,876	67,638	5,012	159,853

* Eleven months ending November.

PETER F. LOFTUS

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Zinc Statistics Show Record Stocks

Following the lifting of censorship regulations, the American Zinc Institute released for publication for the first time in a year and a half its statistics covering the production, domestic and export shipments, stocks and unfilled orders of all grades of slab zinc. The figures by months and years up to and including November, 1943, serve to confirm that the zinc situation has undergone a remarkable change for the better since Pearl Harbor. *The American Metal Market* points out that while it may be reckoned to be extremely comfortable from the standpoint of the Government, there is a natural anxiety on the part of the zinc producers caused by

Central



States

Metal Mining in the Central States, 1943

THE total mine production of silver, copper, lead, and zinc from crude ores, in old tailings, and other material treated in the Central States in 1943, in terms of recoverable metals, was approximately 159,231 ounces of silver, 48,020 short tons of copper, 211,773 short tons of lead, and 223,468 short tons of zinc, according to the Joplin office of the Bureau of Mines, United States Department of the Interior. These figures (based on 11 months actual production with December estimated), compare with an output in 1942 of 130,884 ounces of silver, 46,979 tons of copper, 235,229 tons of lead, and 258,181 tons of zinc and show increases for 1943 of 22 per cent in silver and 2 per cent in copper and decreases of 10 per cent in lead and 13 per cent in zinc. No mine production of gold was reported in the Central States from 1941 to 1943, inclusive.

The quantity of crude ore mined and old tailings remilled gives a better

index to general mining activity in the Central States in 1943 than the output of recoverable metals. Exhaustion of most of the high-grade ore reserves and utilization of more submarginal ores to maintain adequate metal output for war purposes (made feasible by increasing the amount of Government bonus), necessitated handling larger tonnages of rock per ton of metal recovered. The total copper, lead, and zinc mine rock milled increased from 17,984,000 tons in 1942 to 19,042,000 tons in 1943 and old tailings from 12,742,620 to 13,385,000 tons. The quantity of metal recovered per ton of crude ore milled in 1943 decreased approximately 11 per cent from 1942 for copper ore, 9 per cent for lead ore, and 20 per cent for combined zinc and zinc-lead ores. Zinc recovered per ton of old tailings also decreased 20 per cent, but copper increased 23 per cent.

OKLAHOMA

» » » At the annual meeting of the Tri-State Zinc and Lead Ore Producers Association held December 8, Charles A. Neal, of Miami, was elected president to succeed John A. Robinson, who completed serving nine years in the office. Other officers and directors named were as follows: George W. Potter, first vice president; Victor C. Allen, second vice president; L. G. Johnson, treasurer; Charles A. Beck, O. W. Bilharz, Paul Childress, R. O. Gibson, F. W. Gooch, D. G. Harrison, H. H. Hartzell, John J. Inman, S. L. Kenney and Howard H. Utley. Fred F. Netzeband is acting secretary, and no changes were made in the personnel of the Association or staff, which will continue to carry on its work and activities as heretofore.

Need 6 to 10 yd. dragline—150' boom or other machine capable of stripping 65' of dirt. Also experienced operator. Buy or rent.



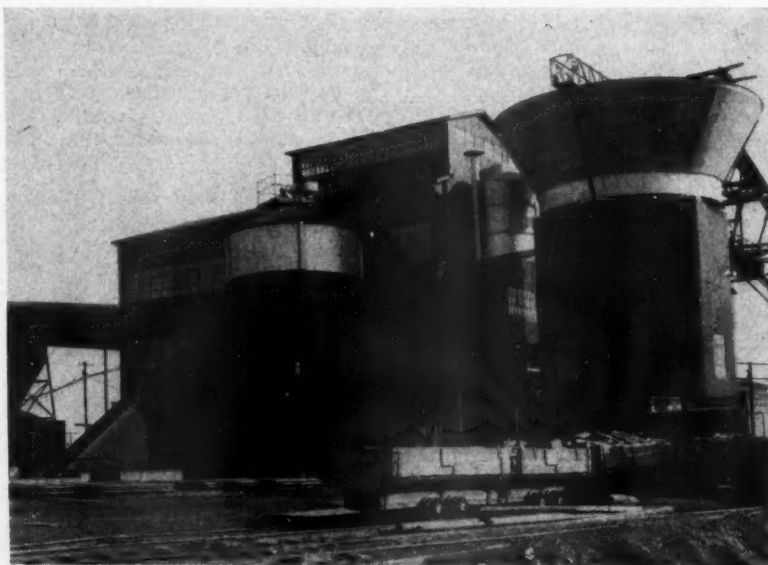
DAKOTA COLLIERIES COMPANY
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» » » Tongaha Mining Company has started mining operations on the old Canam Foch lease, 2 miles west of Picher.

ILLINOIS

» » » The 51st Annual Meeting of the Illinois Mining Institute was held at the Abraham Lincoln Hotel, November 12, 1943, with an attendance of 365 coal operators and manufacturers. There was a morning and afternoon session followed by the annual dinner and the election of the following officers for the year 1944 was announced: B. H. Schull, Pyramid Coal Corp., president; George F. Campbell, Old Ben Coal Corp., vice president; B. E. Schonthal, B. E. Schonthal & Co., secretary-treasurer; H. A. Reid, United Electric Coal Cos.; Paul Halbersleben, Sahara Coal Co., L. F. Lumaghi, Jr., Lumaghi Coal Co., and Harry M. Moses, H. C. Frick Coke Co., new executive board members.

At the morning session, D. J. Harrington, U. S. Bureau of Mines, spoke of the work being carried on by the Coal Mining Section in connection with safety, health, explosives control and mineral resources; a joint paper by D. W. Jones, Princeton Mining Company, and E. H. Johnston, Jeffrey Manufacturing Company, showed a motion picture and described a service haulage system for mechanical loading using large capacity transfer cars at the working face. At the afternoon session Dr. M. M. Leighton, Illinois Geologic Survey, showed an educational film presenting the activities of the survey; this was followed by a paper by L. H. Sherwood, Little John Coal Company, giving a history of the development of coal strip mining and the final paper at this session was by Mr. Thomas Moses outlining the plans of the Committee which has



Cleaning plant of the No. 14 mine, Crerar Clinch Coal Co., DuQuoin, Ill.

been organized to conserve manpower by preventing accidents. At the annual dinner T. J. Thomas, president, Valier Coal Company, presided as toastmaster, and an address on the wartime accomplishments of the railroads was given by L. W. Baldwin, chief executive officer Missouri-Pacific lines.

KANSAS

» » » Glennray Lead and Zinc Company has begun the building of a 100-ton mill on the Brugger land, a mile northwest of Baxter Springs, according to W. A. Martin, of St. Louis, who is in charge of the construction. The mill is being built on the site of the old Ramage mill, and it is planned to retreat some of the tailings on the 113-acre tract as well as mine ore, according to reports.

The company recently reopened a shallow shaft, about 37 ft. deep, and sunk it to the 74-ft. level. Lead ore, averaging 3 to 4 percent in recovery values, was encountered at the 52-ft. level and continued to the bottom of the shaft, according to Ray Barron, of Joplin, who is interested in the company.

OHIO

» » » The consolidation of the management of the mines of the Crow Hollow division of the Jefferson Coal Company, located near Smithfield, with the other Hanna operations in eastern Ohio, was announced January 11 by R. L. Ireland, Jr., president of the Hanna Coal Company. The action was taken at a meeting of the board of directors of the Hanna and Jefferson Coal Companies at Cleveland, December 30.

At the same meeting, James Hyslop, St. Clairsville, general manager of the Hanna Coal Company in the field, was appointed vice president in charge of operations of these two companies.

The Crow Hollow mines have been handled for the past year from the Cleveland office of the Hanna Company, but effective at once, the management of these mines is being transferred to the St. Clairsville headquarters of the Hanna Company.

The Crow Hollow operations in Jefferson County consists of three mines—Nos. 1, 2, and 3, and employs about 600 men. The action taken in merging the management of Crow Hollow with the other Hanna operations brings the total number of employees of the Hanna Company to well over 2,800 and places the company not only the largest in Ohio but places it among the heaviest producers of bituminous coal in the nation. The normal tonnage of the Hanna operations will now reach in excess of six million tons per year.

Mr. Hyslop has announced that

C. R. Nailler, St. Clairsville, has been promoted from production manager to general manager of underground mines. J. S. Harmon, Cadiz, has been promoted from superintendent to general superintendent of strip mines. C. C. Hagenbuch, St. Clairsville, who has been chief mining engineer, has been promoted to engineering assistant to the vice president.

» » » The North American Coal Corporation, through one of its operating subsidiaries, has acquired all the assets of the Sheban Mining Com-

pany, located at North Lima, Ohio, producing high-grade cannel coal.

MISSOURI

» » » Eagle-Picher Mining and Smelting Company completed the dewatering of the lower workings of the Oronogo mining area in mid-December, following several months of pumping operations begun a few weeks after the flooding of the mining field last May.

Dewatering of the 220-ft. level in



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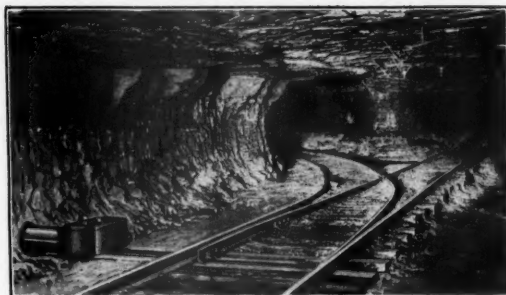
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THE AMERICAN MINE DOOR CO. 2063 DUEBER AVE., CANTON 6, OHIO

the open-pit mine of the Oronogo Mutual Mining Company will permit the resumption of mine operations at the lower level, after the roadways underground have been repaired and cleaned up.

» » » Mine operations began during December at a newly completed shaft of the Eagle-Picher Mining and Smelting Company on the Decker land, a half-mile northeast of Wentworth. A derrick and hopper have been erected at the mine, and ore rock is being trucked to the company's Navy Bean mill, 3 miles west of Wentworth. The company is reported to be operating nine prospect churn drill rigs in the Wentworth area and two in the Diamond vicinity.

» » » F. W. Evans Mines is dewatering the Walker shaft, on the McBee-Martin boundary line, a half-mile north of Smithfield, according to F. W. Evans, of Joplin. Two 8-in. Fairbanks-Morse turbine pumps, powered by Diesel engines, are being operated in the dewatering of the mine. Upon completion of the dewatering the mine workings will be lowered to around the 150-ft. level as the ore is believed to continue down to that level.

Near by Glenn Ritchey and associates have been mining a rich body of ore during the last year. The Ritchey Mining Company's derrick-hopper and other mining equipment were destroyed by fire a few months ago. Meanwhile the company has sunk a new shaft to about the 140-ft. level, and installed new mining equipment, including an 8-in. turbine pump to handle the water.

The St. Louis Mining and Milling Company, near Thoms Station, has been milling the Ritchey ore, and it is planned to truck the Evans ore to the company's old R., H. & G. mill at Waco.

TEXAS

» » » The expansion program at the El Paso, Tex., copper refinery of the Phelps Dodge Refining Corp., which practically doubles the capacity

of the refinery, is reported as completed. The original plant was completed in 1930 with a capacity of 100,000 tons of refined copper per year. The multiple system of refining is used with current density of 15 amperes per sq. ft., and the processing tanks containing the electrolyte are concrete, lined with sheets of metal made of lead and antimony. Natural gas for the refinery is piped from a New Mexico gas field 150 miles away. Water is obtained from deep wells on the ground. Copper anode plates come from the Arizona smelters of the Phelps Dodge Corp., parent company of the Phelps Dodge Refining Corp.

MINNESOTA

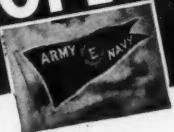
» » » The Cuyuna iron range of Minnesota established a new peak for ore shipments in 1943. The 1943 record was 3,066,061 gross tons

as compared with the former peak of 3,035,554 tons in 1942. This brings the grand total of production from the Cuyuna range to 50,025,965 tons, covering the period from 1911 to 1943.

MICHIGAN

» » » The Calumet & Hecla Consolidated Copper Co. has passed the 1700 ft. mark in the sinking of a shaft at its Iroquois copper mine, located north of Calumet, Mich. The mine is now connected by railroad with the main line at Ahmeek for transportation of copper rock to the stamp mill, and rail connections have also been completed with the Allouez mine where shaft work and new surface construction has been under way. The dewatering of the long idle Centennial copper mine has reached the 38th level. These activities are part of the Calumet and Hecla's current program to boost output of newly mined copper.

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Western



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ARIZONA

» » » The Charleston Lead Mines

Company operating near Charleston, Ariz., about seven miles from Tombstone, is preparing its mine for immediate production of lead and zinc. A contract has been completed with Shattuck-Denn Company of Bisbee to float the concentrates and make the separation of lead and zinc, the ore also carrying some silver and copper. The Charleston company secured an RFC loan on the property and are now busily engaged in the preliminary operations of unwatering and getting the workings in shape.

» » » Rapid progress is reported from the new Tonopah open-pit of the Consolidated Coppermines Corporation at Kimberley. The stripping contract was let to Isbell Construction Company of Reno, and the overburden now being removed is being dumped in a nearby subsidence area which was mined underground by the caving method.

» » » A drive to recruit 1,800 additional workers for Arizona's copper mines, mills and smelters was conducted in New Mexico and west Texas by the state office of the War Manpower Commission in early December. The program, endorsed by Arizona copper companies, was expected to meet the state manpower requirements in mines for some time. The number of workers produced by the project has not been reported.

» » » First units of the Defense Plant corporation mill facilities at the Morenci plant of the Phelps Dodge Corporation were placed in operation in early December. Mill facilities were built solely by the Federal agency in an effort to double copper production at the huge open-pit mine. Construction work was begun about 18 months ago, at which time the corporation announced the proposed expenditure of \$23,000,000 to expand the Phelps Dodge installations. Other units are yet to be completed, it is said.

» » » The Silver Shield Mining Company of Salt Lake City, Utah, has been given a bond and lease on

the Antler copper-zinc mine, near Kingman, in Mohave County, recently taken over by R. B. Strassburger, of New York City, and will operate the property. It is reported that a production of 100 tons of ore per day is planned.

» » » High cost of operation has led to the closing of the Cerbat mine by F. A. Morrison and his associates. Recent shipments of high-grade cerussite and galena ore carrying a fair percentage of gold and silver have been made to the U. S. smelter at Midvale, Utah. The Cerbat mine was one of the early-day high-grade gold and silver mines owned and operated by the late John Barry, who milled oxide ores with steam power arrastras in the late seventies.

» » » Preliminary construction work is under way at the Phelps Dodge Corporation Horseshoe dam site on the Verde River in central Arizona, as the result of an agreement between the corporation and the Salt River Valley Water Users Association. The company will be allowed to pump 14,000 acre-feet of water annually from the Black River system for its Morenci plant. The company will lay a pipe line from the Black River to Morenci. The dam is to be a rock-filled structure with a capacity of 60,000 acre-feet of water, and it is said that the cost will run between \$1,500,000 and \$2,000,000.

» » » Arizona small mine operators have obtained a total of \$1,500,000 in operating loans from the Federal Government and many already are making payments on their loans, it is reported by A. MacFarlane, district field representative of the Arizona Small Mine Operators' Association.

» » » A long term option on the Irene mine, three miles north of Globe adjacent to the Old Dominion, has been granted to the American Zinc, Lead and Smelting Company of St. Louis, Mo., by the Liberty Mining Company, it has been reported. The Irene at one time was a silver property worked in the early mining days of the state; and considerable development work has been done at the mine since 1929, it is said. Zinc and copper ores are now sought.

» » » Construction work preparatory to the opening of large scale open pit copper mining in Cananea, Sonora, Mexico, south of Douglas, Ariz., is reported for the Cananea Consolidated Copper Company, subsidiary of Anaconda. Approximately 2,200 men are now employed in the development work.

Included in the construction work are a concentrator where three large capacity crushers will be installed. The company has a 10-mile, 16-in. pipeline under construction to supply water furnished by wells and springs in the area.

The most of the heavy machinery will be electrically operated, and the company has constructed a power plant and lines. Also erected are 20 five- and six-room dwellings; 57 smaller houses for laborers; and 40 two-room wood units to supplement trailer houses. The mine is located at 6,305 ft. above sea level, and 1,500 ft. higher than the town of Cananea itself.

NEVADA

» » » The War Production Board has withdrawn its recommendation for the construction of a Waelz zinc plant at Jean, Sparks County, Nevada, but the Metals Reserve Company will continue to stockpile zinc-lead ore there for the present. The proposed plant, for which \$341,000 was allocated by the Defense Plant Corporation more than a year ago, was to have been operated by the Western Metal Company with the output contracted to the Metals Reserve Company.

» » » The Nevada State Bureau of Mines now has for distribution a new bulletin on "Nevada's Metal and Mineral Production (1859-1940, inclusive)." This bulletin is based upon the declared tonnage and gross value produced of all the operating mines, as required by the net proceeds or "bullion" tax as provided for in the State Constitution adopted in 1864. The 80-year record of mining in the state is presented in a series of tables giving for the state as a whole, its production by years, by counties, and by districts; for the counties, their production by years, and by districts; and for the districts, their production by years, and every producer therein with a recorded production of over \$5,000. A review is given of the his-

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★
DAKOTA COLLIERIES COMPANY
1506 Foshay Tower
Minneapolis 2, Minnesota

tory of mining for the state and for each county, and in addition a study of mine taxation in Nevada.

This comprehensive, 160-page bulletin is the work of Bertrand F. Couch and Jay A. Carpenter, respectively secretary and director of the Nevada State Bureau of Mines and the MacKay School of Mines. Copies are available at the cost of printing, 50 cents.

» » » Destruction by fire of the 250-ton tungsten concentrator of the Nevada-Massachusetts Company at Mill City on Armistice Day has brought from President Charles H. Segerstrom the statement that it is the purpose to rebuild as soon as materials and equipment can be obtained. The time and type of reconstruction will depend, to some extent, upon loss adjustment made by insurance companies.

The concentrating plant was destroyed on the 25th anniversary of the day it first operated. Efforts were made to get the plant in operation before World War I came to an end, and many delays were encountered. The plant continued in operation for some time after the signing of the armistice, but due to the drop in price it was closed and eastern bondholders became the owners. Later it was acquired by Segerstrom and associates.

At first, the mill was of 125 tons capacity. It was the experimental mill for the tungsten industry and led the way to many improvements in handling tungsten ores. The Nevada-Massachusetts mine is one of the three largest producers of tungsten in this country.

» » » R. T. Hamilton of Lovelock has entered into an agreement with Cooper Shapley, engineer acting for the General Chemical Company, whereby 12 claims of acid spar in Black Canyon, in the Lovelock vicinity, were optioned. The value of the acid spar in the war effort is said to have been greatly enhanced within the last few months since its product, hydrofluoric acid, can be used in the improved production of high octane gasoline.

» » » Basic Magnesium, Inc., and Wells, Inc., a trucking concern which has been hauling brucite from Gabbs Valley to the railroad at Luning, have entered into an agreement whereby the Wells firm will haul by huge Government-owned trucks an average of 160,000 tons of magnesium oxide and concentrates annually from Gabbs direct to Basic Magnesium at Las Vegas. Wells, Inc., has arranged for use of the trucks, which are owned by the Defense Plant Corporation. It will be a 668-mile round trip and the schedule calls for a round trip every 28 hours, each truck carrying from 28 to 30 tons a trip, spaced at 74-

minute intervals. These truck units cost \$24,000 each and are specially designed.

» » » After three weeks of court trial and a week of arguments Basic Refractories, Inc., has won a verdict giving it immediate possession of part of six-tenths of an acre of ground comprising a portion of the Bluestone claim property of the Standard Slag Company. Immediate possession was sought, it was pointed out by Refractories, so that it could continue with-

out interruption the operation of its huge brucite and magnesite deposit in Gabbs Valley. The initial court action was the first step toward condemning the six-tenths acre. The suit was transferred to the district court in Reno from Tonopah.

» » » Members of the Nevada State Advisory Mining Board meeting at the governor's office in Carson City recently, expressed full approval of the amended Scrugham stockpiling bill, and registered a protest against

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the movement by certain federal bureaus to bring all mining claims under the leasing system and to abolish the long-established location procedure.

» » » Priorities for much of the material required for camp construction and a water system have been granted by the War Production Board for the Molybdenum Products Company operating the Blue Bucket cinibar mine in the Bottle Creek district, Humboldt County. E. George Howe, president of the company, indicated that building construction is to begin shortly. Reports from officials of the company are to the effect that seven shafts have been sunk at intervals over a distance of 1,500 feet along the north-south trend of the ore zone and a crosscut tunnel driven 290 feet and cutting the ore channel. All of these workings are reported to be in ore of a highly profitable grade.

MONTANA

» » » For the first time since America was plunged into war, the Anaconda Copper Mining Company's mines at Butte did not operate on Sunday, December 5, and in the future Butte miners will have Sundays for rest and recreation.

The Anaconda Company has put into operation a six-day production week in place of the seven-day week which has prevailed since December 14, 1941. This action was taken with the approval of the War Production Board on the expectation that there will be no reduction in the output of the mines. There will be no reduction, under present conditions in the number of days per week each man in the mines will work, nor in the number of hours per week. This means that individual earnings will not be decreased by the change but that all mining crews on the hill will have their days off on Sundays.

UTAH

» » » The annual meeting of the Utah Metal Mine Operators Association was held in Salt Lake City on Monday, December 13, 1943. Officers elected for the year 1944 are as follows: D. D. Moffat, president; F. A. Wardlaw, Jr., first vice president; E. H. Snyder, second vice president; James W. Wade, third vice president; and A. G. Mackenzie, manager.

» » » Pig iron production was begun January 3 at the Government's new \$180,000,000 steel plant near Provo, Utah, with the blowing in of the first blast furnace. This plant is operated for the Government by Geneva Steel Co., U. S. Steel subsidiary. The first iron will be tapped approxi-

mately 40 hours after blowing in of furnace.

This blast furnace, embodying the most modern features of design, is one of three which have been erected at western America's largest integrated steel mill. Each furnace has a daily capacity of 1,100 tons of iron.

Construction of the plant for the Government was begun by Columbia Steel Co., West Coast subsidiary of U. S. Steel, in April, 1942. In August of this year, Geneva Steel Co., a newly formed U. S. Steel subsidiary, contracted with Defense Plant Corporation to operate this great war plant for the duration without profit or fee.

Iron ore was brought to Geneva from Columbia Steel Company's open pit iron mine near Cedar City, Utah. An automatic conveyor-stacker is used to bed down the ore at the plant in neat elongated piles to assure a uniform iron content when it is fed into the blast furnaces. Coke is being produced in the coke by-products ovens at Geneva which began operations December 14, using coal from the newly developed Geneva mine in southeastern Utah. Limestone and dolomite, other raw materials used in smelting iron ore, are obtained from Keigley Quarry, a part of the Geneva project located 25 miles from the plant.

» » » Utah Copper Company recently made the largest tax payment in its history. A check for \$1,741,329 went to the County Treasurer, covering 1943 property and net proceeds tax. It has also paid a state franchise tax of \$166,000; occupational tax, \$678,350; a sales tax and use tax of approximately \$147,000 will be paid. In addition, is the unemployment insurance of about \$278,000, bringing total taxes to over \$3,000,000.

NEW MEXICO

» » » No other mining or milling operation in the southwest corner of New Mexico was ever awaited with more anxiety and interest than the test run of the new fluorspar mill at Gila, N. Mex., the first mill of its type in the area. This interest is due to the numberless fluorspar deposits, large and small, in New Mexico, and the critical position of fluorspar in the war calendar of non-metallics. The mill was built and will be operated by the International Mineral and Chemical Company of Carlsbad for the Metals Reserve Company. Construction was under the direct supervision of E. C. Anderson, who will also have supervisory charge of operations. H. L. Gardner will be the operator in charge. Both Mr. Anderson and Mr. Gardner are well-known mining men who have long been associated with the Potash Division of the International Mineral and Chemical Company.

The capacity of the Gila mill is 300 tons daily, operating on three 8-hour shifts. The mill is powered by three Diesel engines and will employ 30 men when in full swing. Arrangements were made at the start of construction to immediately begin the purchase of ore and a stockpile of more than 10,000 tons has been sampled and graded ready for milling. The plan is to produce a metallurgical grade spar and to only buy ores that will lend themselves to sink-float, jig and table processing. Many of the small ore producers supplying the mill promise to develop into sizeable operations due to this excellent market and present prices. The bulk of the ore supply now comes from the McCray & Penn mine at Tyrone and the Brown Johnson operation in Gila Canyon.



This 40-ton Gould rotary plant has been moved to the Polar Star quicksilver mine in San Luis Obispo County, Calif.

» » » One of the 1943 mining successes in New Mexico is recorded by the Peerless mine, in the Central Mining District, being operated by the New Mexico Ore Processing Company.

In a report to stockholders of the company made December 15 by D. W. Schmitt, vice president and general manager in charge of operation, it was revealed that while several large companies had previously given up leases to the Peerless mine because the ore had faulted and the mine was considered of no further value, 10 months of operation by the present company has produced nearly a quarter million dollars in ore value and paid two dividends of 25 percent each to stockholders. The ore production for the first half of December was reported as equal to the best previous full month's operation. A large ore reserve has been developed, principally new ore that has never before been known to exist in this mine. In places the ore bodies reach 20 ft. in width, the general average being 8 ft.

» » » The new \$155,000 Gould furnace plant of the New Idria Alaska Quicksilver Mining Company's Sleemut operations in Alaska, construction of which was begun early in June, was put into operation on October 4. A large part of October was spent in regulating and adjusting the furnace operations, and it is reported that 35 tons of ore will be handled daily. Wood fuel is used in the place of oil and this has required extra metallurgical adjustment.

Stopping of ore at two points underground is now taking place and the mine will be in operation all winter, although labor shortages present some difficulties. It was expected that the main shaft would be sunk another 50 ft. this winter. The quicksilver output is being kept in storage at the mine and will be shipped by boat next summer to the Metals Reserve Company.

IDAHO

» » » Millions of tons of high-grade magnetic iron ore are reported in a district about 12 miles from Grangeville, Idaho, by Walter Hovey Hill, veteran mining engineer of that section, who has been prospecting the district in company with Philip J. Shenon, head of the regional office of the U. S. Geological Survey, and Dr. J. H. Mackin, of the University of Washington.

"The several iron croppings are magnetic," says Mr. Hill, who is a member of the advisory mining committee of the Idaho State Planning Board. "The deposits have remained

dormant," he said, "because of their isolated location and lack of a market. They are the largest known deposits in the Western States and in character are an exceptionally high-grade magnetite, containing no sulphur, titanium or phosphorus, but including enough manganese, 2 to 3 percent, to rank in quality with Swedish iron of which armor plate is made."

Estimates of the possible tonnage in the deposits without diamond drilling operations are being made by Lyle E. Shafer, of the U. S. Bureau of Mines; S. H. Lorain, district engineer; the U. S. forest engineer of Grangeville; and a U. S. public roads engineer from Utah. The Forest and Roads Departments are interested because opening of the district would include 2 miles of forest road giving access to 45,000,000 ft. of timber recently purchased from the Government by the Potlatch Lumber Co.

» » » At the request of the Office of Censorship, the Sunshine Mining Company has discontinued detailed reports of ore tonnages produced, grade of the ore, and the quantities of silver, copper, lead and antimony recovered, according to the preliminary report issued by R. D. Leisk, general manager, covering the last three months' operations in 1943. Mining operations at the Sunshine, according to the report, have largely been transferred to the Chester vein, scene of an exceptionally rich discovery recently, "where the production of lead, copper and antimony per man is much higher." In this new area the Sunshine is working under production agreements with both the Polaris and Silver Syndicate companies. Production from Polaris holdings on the Chester vein are on a 50-50 basis and with Silver Syndicate on a 60-40 basis, with 60 percent from Sunshine.

According to W. M. Yeaman, president of the Silver Syndicate, production from this vein has produced remarkable results. In about 70 ft. of drifting on the vein, he stated, the company has produced ore of a gross value of \$51,878 with a net operating profit of \$35,449, all of which was from development work ore. The ore body is said to be about 8 ft. wide and carries exceptionally high values in both lead and silver.

» » » Dr. Paul J. Raver, Bonneville power administrator, describes Idaho phosphate deposits as "the largest in the world." The deposits, he said in a public address, "can be used for the commercial fertilizer industry, provided you have large amounts of cheap hydro-electric power, and that power is the key to unlocking the great mineral resources all around us. During the

past five years we have added 1,000,000 kilowatts of hydro-electric capacity to this region by means of the Grand Coulee and Bonneville Dams, but we can look forward to developing 25 times as much power," he said. "There are 25,000,000 kilowatts still undeveloped in the Columbia Basin. No place else in the world do you have such an opportunity."

» » » The Howe Sound Mining Company, operating at Britannia Beach, B. C., and Lake Chelan, Wash., is reported to have optioned a large acreage of potential copper-gold-cobalt mining property in the Blackbird district, 35 miles southwest of Salmon, Idaho, in Lemhi County. The U. S. Bureau of Mines has been diamond drilling the district for several months and report the discovery of at least 200,000 tons of the ore. Ore dressing tests by the Bureau have proven that the ores can be treated on a satisfactory saving basis.

CALIFORNIA

» » » Strenuous opposition to federal bureau trends in regard to the handling of public lands for mining development is expressed in a resolution unanimously adopted on December 21 by the Board of Directors of the San Francisco Chamber of Commerce on recommendation of its Mining Committee.

The Chamber reaffirmed its stand in behalf of private enterprise, contending "that the experience of nearly a century has demonstrated the soundness of our present mineral land laws as applied to the location and patenting of such of those lands as are or may be found to be valuable for their metal content."

Action by the Chamber crystallizes its position as a result of reports that the Secretary of the Interior has been planning radical changes in the methods of handling federal public lands. It also brings to public attention in this region the fact that the General Land Office has been protesting all applications for mineral patents on the basis of an apparent general policy differing from that which has been a factor encouraging development of the Nation's mineral resources for scores of years. The mining industry has made a major contribution to the war effort, it is claimed, and the fundamentals on which its productiveness has been based should not be altered now.

The resolution as adopted is as follows:

WHEREAS, since the year 1866 it has been the policy of the Federal Government of the United States to throw open to location by individuals such of the public lands of the United States as may be found to contain metals capable of being mined in paying quantities; and

WHEREAS, in reliance on this declared national policy, the principal domestic economy of several of the Western States of the country, and the principal economic resource supporting many counties in all of the Western States has been built up through the production of minerals by private enterprise and with the use of private capital; and

WHEREAS, it is now reported from authentic channels, including certain members of Congress and in the statements made by the present Secretary of the Interior in support of Senate Resolution No. 53 on July 23, 1941, that the Department of the Interior and the General Land Office in that Department are supporting and favoring a change in the national policy so as to provide,

(a) the requirement for Federal recordation of new and outstanding mining locations and annual reports on assessment work on such claims, with a view to canceling the same by action of the Federal Government if such requirements are not met; and

(b) to substitute for location and patenting of public lands to private individuals a mineral leasing system which would normally require the development of these lands under Government supervision and the payment of royalties thereon to the Government; and

WHEREAS, such a leasing system will constitute only another step in the direction of bureaucratic Government control over legitimate private industry and the restriction and hampering of private enterprise, all of which is contrary to the fundamental principles under which the economic prosperity of the United States was built up;

Now, therefore, be it

Resolved, that the San Francisco Chamber of Commerce, acting upon recommendation of its Mining Committee, does hereby vigorously protest these reported plans to expand the Government leasing system of public lands so as to cover those lands which are valuable for their metal content, to require Federal recording of location notices and proofs of annual labor, and to exact royalties from and extend the bureaucratic control of the General Land Department over the free enterprise of prospectors and locators who for nearly a century past have been responsible for the discovery and production of the valuable metal resources of this country; and, be it

Further Resolved, that the San Francisco Chamber of Commerce urges a discontinuance of the present reported policy of the General Land Office in protesting all applications for mineral patents in mining regions requiring technical and unreasonable demonstration of mineral values in advance of full development of the

properties where the location of claims with respect to proven lodes and ledges is such that no reasonable doubt of this value for mineral purposes can exist. In this connection the Chamber urges a return to the former policy of the Land Department in encouraging the development of properties in such proven mineral areas through the liberal granting of patents where the same are applied for and reasonable compliance with the statutory conditions has been shown; and, be it

Further Resolved, That the San Francisco Chamber of Commerce reaffirms its belief that the maximum development of our public resources and mineral lands will be accomplished through encouraging private initiative, private prospecting, private development and private production of these resources, and that the experience of nearly a century has demonstrated the soundness of our present mineral land laws as applied to the location and patenting of such of those lands as are or may be found to be valuable for their metal content; and, be it

Finally Resolved, that copies of this resolution be sent to the California representatives in Congress, to the public and mining industrial press, with a view to a united stand in opposition to this socialistic program.

|| Wheels of Government

(Continued from page 53)

Another provision states that if at any time a significant change occurs in the Government wage policy, either party may request a further negotiation of the wage scale. As yet the War Labor Board has made no announcement concerning approval or disapproval of the contract.

The Southern Coal Producers did not participate in the making of the new contract and Association President Edward R. Burke, in stating his belief that their non-participation was correct, stressed that the agreement is based upon an assumed 45 minutes for travel time whereas in many cases the assumed extra hour of productive time will not be realized. Burke voiced objection to the agreement as predicated upon the assumption that travel time is work time, insisting that wage scales in the coal industry have always been negotiated on the basis that work time is confined to the productive hours of labor.

Revision of Order P-56

General Preference Order P-56 was issued in revised form effective December 24, 1943. This latest action by WPB on behalf of the mining industry is presented in a complete description appearing on page 57 in this issue of the JOURNAL.

— BOOKS —

SALVAGE MANUAL FOR INDUSTRY. Edited by seven engineers. Published by Technical Service Section, Industrial Salvage Branch, Salvage Division, WPB. Paper-bound, 6 x 9 in., 250 pages. Price \$.50 per copy. Procurable through the Superintendent of Documents, Government Printing Office, Washington, D. C.

The first comprehensive, practical manual on industrial salvage ever prepared has just been published by the Technical Service Section, Industrial Salvage Branch, Salvage Division, War Production Board, and is now being distributed to industry.

The new book, entitled "Salvage Manual for Industry," contains 245 pages of systematically organized and classified information and data—most of it of a "how-to-do-it" nature—on industrial salvage practice in all its ramifications. Material is presented in 26 chapters, grouped into six major sections. There are 2 chapters on organizing and planning the salvage department; 3 on the administrative factors; 12 on methods of handling (finding, identifying, segregating, collecting, reclaiming, storing, selling, etc.) metal scrap; 3 on non-metallic waste; 7 case histories demonstrating exemplary practice; a 17-page compilation of practical hints for handling specific waste materials; and a 9-page index.

MACQUOWN'S COAL DIRECTORY AND BUYERS GUIDE, National Coal Publications, Berger Building, Pittsburgh, Pa. Standard—\$25, Abridged—\$15.

The twenty-first edition of MacQuown's Coal Directory and Buyers' Guide is now available for immediate delivery. This volume is a complete and comprehensive directory of coal producing and selling companies, presenting valuable data, maps and detailed operating information covering the industry.

COAL FACTS, a booklet which has recently been published by Bituminous Coal Institute, contains 34 pages of interesting statistics on bituminous coal, including data on by-products, utilization, costs, safety, earnings, etc. Copies, complimentary, will be furnished upon application to their main office at 60 East Forty-second Street, New York 17, N. Y.

Manufacturers Forum

Marion Appoints Westland and Moseley

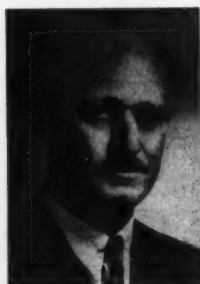
The Marion Steam Shovel Company, Marion, Ohio, announces the appointments of Walter W. Westland as sales manager and L. C. Mosley as manager of the Mining Division.

Mr. Westland joined the Marion organization in 1925 upon completing his studies at Massachusetts Institute of Technology. In 1927 he was transferred to the New England sales branch of the company and in 1932 was made district manager of this office, a position he has held until his present appointment as sales manager at the home office.



Walter W. Westland

Mr. Mosley, who succeeds the late Homer Littlefield joined the company



L. C. Mosley

in 1925. He has devoted his efforts to sales engineering, specializing on the application of power shovels of various types to open pit mining. His 18 years' experience and contacts with the problems of open pit mining well fits Mr. Mosley for his new job and he should prove to be an invaluable aid to everyone with an open pit mining problem. He will make his headquarters at the home office in Marion.

Companies Consolidate

The Asbestos Fibre Spinning Co., North Wales, Pa., has been purchased by Greene, Tweed & Co., New York, N. Y., manufacturer of Palmetto and other self-lubricating mechanical packings and also various mill supply specialties.

This consolidation brings together two companies of many years' existence; Greene, Tweed & Co. having been established in 1863 and Asbestos Fibre Spinning Co. in 1898.

More Mileage for Old Belting

Industrial So-Lo, a product for repairing breaks, burnt or worn spots, filling holes and for resurfacing industrial belts of all types—rubber, rubber composition, leather, and cotton—is now being made with synthetic rubber. The manufacturer claims it will greatly lengthen the life of belts and permit continued use of some conveyor belts that might otherwise be discarded. It is easily applied, dries tough overnight, and is very economical.

Many superior advantages are claimed for Industrial So-Lo in its new form. It is said to have greater resistance to oil and grease, less shrinkage, spreads easily, and dries more smoothly. The product consists of a cement primer and a mastic. The belt surface is roughened and the primer applied. The mastic is then spread on.

Industrial So-Lo is also used for resurfacing metal, wood, and composition pulleys, to which it readily adheres, preventing slipping and cutting down wear. It safeguards workers when used as an insulator to cover

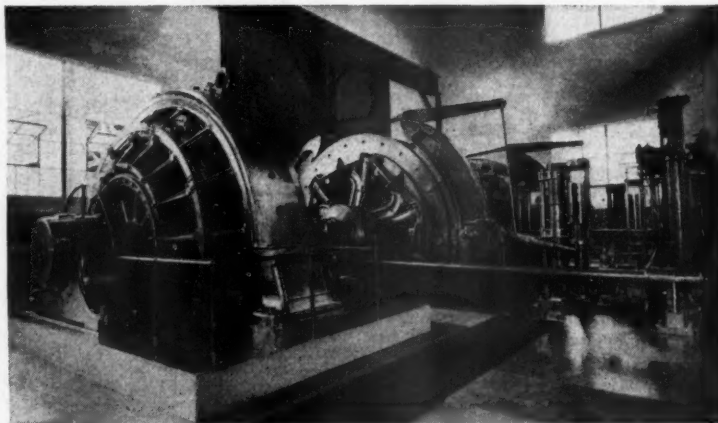
switch handles and other electrical devices; and it prevents slipping when applied to metal and concrete stair treads.

Further information and cost may be obtained upon request to the S. C. Baer Company, 1504 Times-Star Building, Cincinnati 2, Ohio.

New Overlay Metal

Kerk-Aloy, a new overlay metal for surfacing new and worn faces, edges and surfaces is a product of the Kerk-Aloy Co., Hollywood, Calif., an affiliate of Kerkling & Co., Bloomington, Ind. It is said to show a marked ability to bond homogeneously with any metal, except lead and aluminum in abrasive work. Because of its high resistance to wear, the metal is claimed to have been highly efficient on harrow points, steam shovel lips and dredge lips or dippers and other equipment where long, hard service is required. It has also been utilized as a means of reclaiming tappets, rocker arms, push rods, wrist pins,

Hoist Powered to Lift 13 Tons of Iron Ore



Power to lift 13 tons of iron ore 2,000 ft., nearly twice the height of the Chrysler building, in two minutes, is supplied by this 1,650-hp. General Electric motor. Shortly before World War II it was moved to a mine outside Mineville, N. Y. Thus the motor, now performing heavier duty than it was designed for originally, is in its "second generation." It now powers a hoist, center, which can bring more

than one million pounds of iron ore per hour from 2,500 ft. underground. The mine is one of several where production has been stepped up to meet war demands. The mines of north-eastern New York State now yield four billion pounds, or three-fourths of the state output, of sinter—iron ore reduced to cinder for blast furnace production of pig iron.

and numerous other applications on automotive parts, tools and equipment which today are virtually unobtainable.

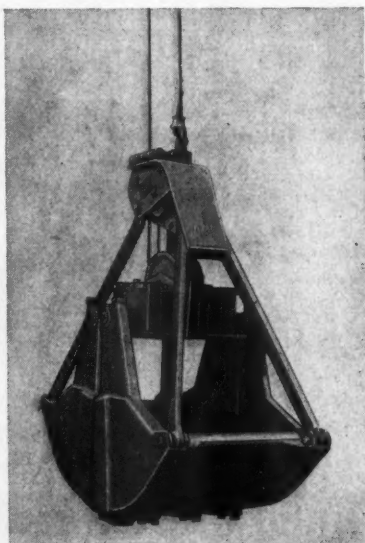
Kerk-Aloy can be applied with an acetylene torch, or an electric arc; does not require the use of bonding fluxes, and flows evenly without the characteristic of gasification.

Free literature containing specifications and engineering data can be obtained through the company's general offices: Kerk-Aloy Co., Bloomington, Ind.

New Clamshell Bucket Announced

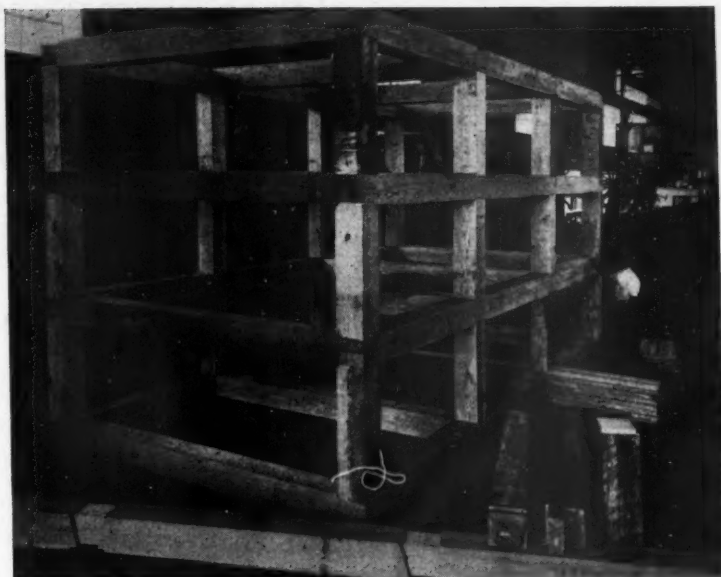
After extensive field tests, The C. S. Johnson Co., of Champaign, Ill., has announced a new all-welded clamshell bucket. One of the major operating advantages of this bucket is a renewable manganese steel lip to provide many times the wear of ordinary mild steel construction, the company says. Closing sheaves are equipped with needle bearings which are protected against dirt and moisture by a special synthetic rubber seal. To prolong rope life, sheaves are of large diameter and guide sheaves have been substituted for guide rollers.

All-welded construction makes dig-



ging easier and faster for there are no external bolt heads or rivets to slow up the operation. The welded design also permits greater stability since the weight can be exactly distributed.

Subject to required Government authorization, general-purpose buckets are available for immediate delivery in the following sizes: $\frac{1}{2}$ yard to $2\frac{1}{2}$ yards; rehandling buckets from $\frac{1}{4}$ yard to $2\frac{1}{2}$ yard capacities; heavy digging from $\frac{1}{2}$ yard to $1\frac{1}{2}$ yard capacities are standard models in the Johnson line.



Pre-framed, pressure-croscoted yellow pine shaft timbers are designed to last the life of the mine. The Wood Preserving Division of the Koppers Company, Pittsburgh, preserved the timber in this shaft bed which is said to be unaffected by freezing, thawing or subjection to acid mine water

Company Changes Name

The West Virginia Rail Company announces the change of its corporate name to West Virginia Steel and Manufacturing Company. The company is located at Huntington, W. Va.

Two-in-One "Dozershovel" Announced by Bucyrus-Erie

With a record of extensive service in the armed forces, for whom it was designed and manufactured, a new two-in-one dirt moving unit—the Dozershovel for T9 and TD9 International TracTracTors—has recently been announced by Bucyrus-Erie Company. Announcement of the Dozershovel comes as a result of production in excess of military demands, making limited numbers of this unit available for civilian use under government release.

The unique design of the Dozershovel provides completely, it is said, for full-fledged tractor shovel and bulldozer service, with simple interchangeability of bucket and blade permitting in-the-field changeovers in a few minutes. As a shovel, the unit's hydraulic control provides down pressure up to 4,200 pounds for real digging "bites" and big pay loads in a short distance of travel. The same control on the bulldozer provides easy penetration in hard materials and ability to hold the



cut. Strong side arms permit the shovel to lift big loads, the dozer to handle any dirt-dozing job. The unit's dumping trip-mechanism gives the dozer a feature unmatched in other bulldozers: ability to tip the blade forward to release the load on uphill dozing.

Other features include unobstructed visibility, low overhead clearance, oscillating tracks and quick, high lift.

Detailed information on the Dozershovel can be obtained from any International TracTracTor distributor or by writing Bucyrus-Erie Company, South Milwaukee, Wis.



INDEX TO ADVERTISERS

	Page		Page
American Brass Co., The.....	54	Joy Manufacturing Co.....	2-3
American Chain & Cable Co., Inc.....	Third Cover	Loftus, Peter F.....	61
American Cable Division		MacWhyte Company	64
American Mine Door Co., The.....	64	Marion Steam Shovel Co., The.....	13
Cleveland Rock Drill Co., The.....	12	Mott Core Drilling Co.....	72
Cummins Engine Co.....	Back Cover	Ohio Brass Co.....	6
Dakota Collieries Co.....	62-65	Pennsylvania Drilling Co.....	72
Deister Concentrator Co., The.....	63	Philco Corp.	40
Edison, Thos. A., Inc.....	14	Storage Battery Division	
Storage Battery Division		Roberts & Schaefer Co.....	8
Electric Storage Battery Co., The.....	5	Robinson Ventilating Co.....	72
Gardner-Denver Co.	7	Roebbling's Sons Co., John A.....	Second Cover
Goodman Manufacturing Co.....	9	Tamping Bag Co.....	66
Hoffman Bros. Drilling Co.....	72	Timken Roller Bearing Co.....	4
I-T-E Circuit Breaker Co.....	59	United States Rubber Co.....	10-11
Jeffrey Manufacturing Co., The.....	38-39	Universal Vibrating Screen Co.....	72
		Young, L. E.....	61

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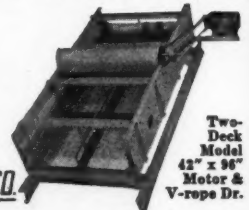
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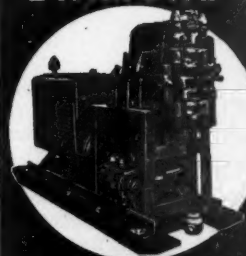
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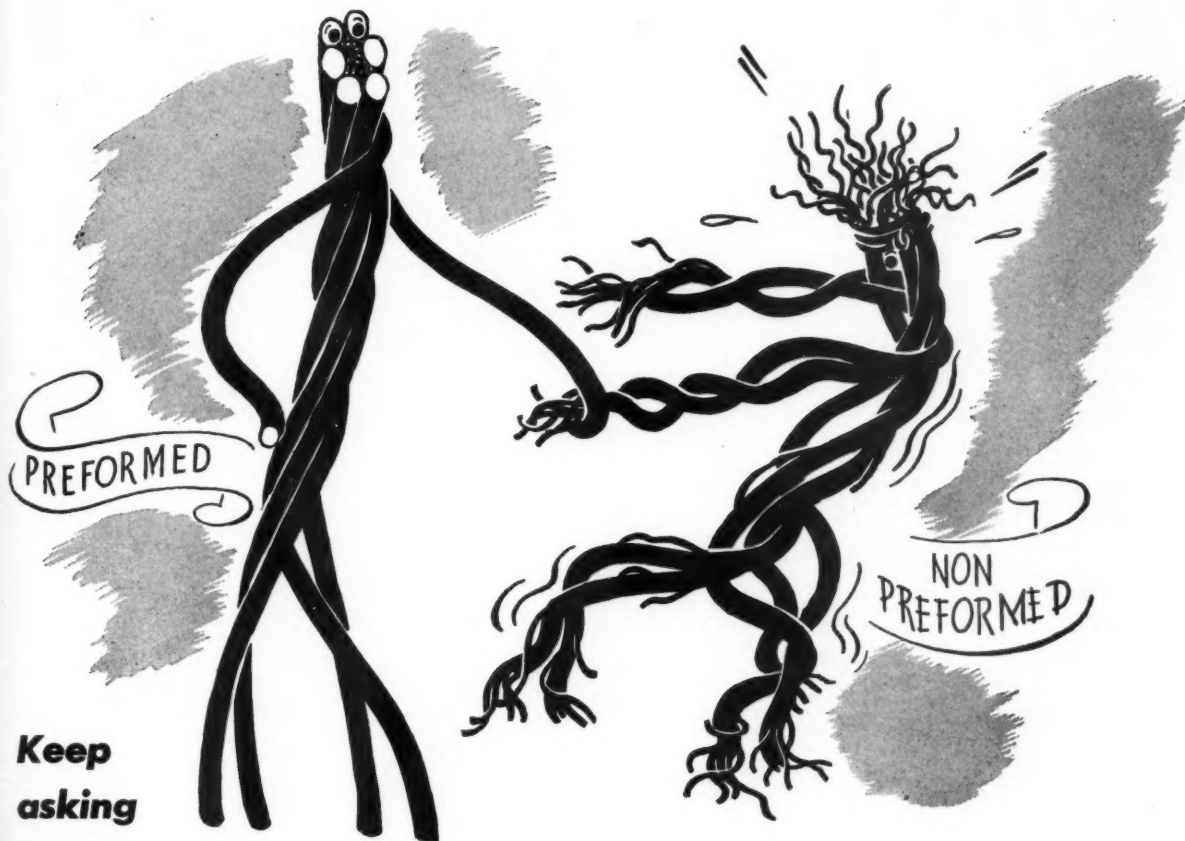


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